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EMPIRICISM.¹

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I.

THERE has always been a certain indefiniteness about the nature of the distinctions between the different types of philosophical theory and correspondingly about the meaning of each particular "ism." It is obviously not an easy matter to describe a whole outlook; an attitude of mind which is felt to cover a wide range of problems cannot readily be communicated without going over all these problems. Thus it is that philosophers who disagree never seem to come to the end of their disagreements, and can hardly even understand one another. But if anything could alleviate such misunderstandings, it would be a resolute attempt to define exactly the issue or issues between different views; and this is a task which is all too seldom undertaken. It is recognised that there is a natural opposition between rationalism and empiricism, but the basis of the opposition commonly remains obscure or is wrongly stated. In a brief discussion of the issue and defence of empiricism I cannot hope to show exactly how this theory should be distinguished from those which go by the names of realism, naturalism, materialism, pluralism, determinism and positivism. These are all, I should argue, connected with empiricism; it is on an empiricist view, and only so, that they can be maintained. But I take empiricism as central, as giving the best general description of the philosophy which the other terms partially convey, because the issue which it raises and which it disputes with rationalism, is fundamental to logic, being concerned with truth itself. In the discussion of this issue the ways in which more detailed issues should be dealt with, will in some degree appear.

Rationalistic theories of all sorts are distinguished from empiricism by the contention that there are different kinds or degrees of truth and reality. The distinguishing-mark of empiricism as a philosophy is that it denies this, that it main-

¹ Based on a paper read at the Annual Congress of the A.A.P.P., Sydney, 1927. The part dealing with geometry (Part II) has been greatly expanded.

tains that there is only one way of being. The issue has been confused in the past by a reference to knowledge. It was quite naturally maintained, by those who postulated different ways of being, that in relation to them different ways of knowing are required. Hence empiricism has been connected, in the history of philosophy, with the view that there is only one way of knowing, and particularly that that way is what was called "sense" in contrast to "reason"; or, rather differently, that sense is the only *originator* of knowledge. But fundamentally the issue is logical; the dispute is about ways of being or of truth, not about ways of knowing truths. It is only after it has been assumed that there are other truths than matters of fact, or that there are objects which "transcend" existence, that a special faculty has to be invented to know them.

Thus, although we naturally associate rationalism with the theory of a mental faculty of reason, the discussion of faculties will become pointless if it can be shown that any postulation of different orders of being is illogical. The same criticism will serve whether the differences are said to be of kind or of degree, since the differences of degree are to be determined in relation to a supposed highest degree, which is that of a supremely real object or Absolute. It is because objects of "higher reality" are supposed to transcend *experience* that the opposition to transcendentalism has the name empiricism. But if experience (by which, of course, is to be understood not our having experiences but what we experience) consists of matters of fact, then it enjoins us to reject all ideals or powers or whatever else may be contrasted with facts. Moreover, rationalistic views are contrary to experience, not merely because they set up something additional to facts, but because they set it above facts, because they make it appear that facts are somehow defective, that they are not real enough in themselves but require to be supplemented by explanations, ends or whatnot, before they can be understood or accepted by a mind.

The chief, and I think final, objection to any theory of higher and lower, or complete and incomplete, truth is that it is contrary to the very nature and possibility of discourse; that it is "unspeakable." The empiricist, like Socrates, adopts the attitude of considering things in terms of what can be said about them, *i.e.*, in propositions. And he regards this not as a "second-best," but as the only method of speaking or thinking at all, since every statement that we make, every belief that we hold, is a proposition. Since, then, the supposed higher and lower objects of experience both take the propositional form, we are concerned with a single way of being;

that, namely, which is conveyed when we say that a proposition is *true*. Deviation from this view must take the form of saying either that facts are propositional but ideal explanations are above the propositional form, or that explanations are propositional and what they have to explain are mere data, not yet propositionalised. But in order to indicate data or ideals, we have to make statements. If there were anything either above or below the proposition, it would be beyond speech or understanding. If, for example, there were anything that required explanation before it became intelligible, we could say nothing about it in its unintelligible form; plainly, then, we could not even say that it had such a form. And, in general, it cannot be maintained either that the proposition is our way of understanding things which in themselves are not propositional, or that we have further ways of understanding the proposition which is in itself defective. Whatever "explanation" may be, it must at least be a relation of such a sort that what is explained and what explains it can both be stated and believed, *i.e.*, are both propositions. But if there is no way of getting behind the proposition to something either lower or higher, we must assume that propositions can stand by themselves with nothing to supplement them, that facts need no explanation. Discourse, in fact, depends on the possibility of making separate statements, in regard to each of which the very same question can be asked—"Is it true?"

It follows that the conception of higher truths than those of fact, and that of a total truth to which all "merely particular" truths contribute, have both to be rejected. The latter view is what is currently called idealism, but since it differs from the former only in holding that there is a highest truth instead of a number of higher truths, it can be regarded as a variety of rationalism. The objection to rationalism is just that what is meant by "truth" is what is conveyed in the proposition by the copula "is." And logically there can be no alternative to "being" and "not being"; propositions can only be true or false. There is no question, therefore, of degrees or kinds of truth; of higher and lower orders of discourse, dealing, *e.g.*, respectively with realities and appearances. The very theory that attempts to make such a distinction has to be put forward in the form common to all discourse, it has to lay claim to the "being" signified by the copula, it has to face the direct question, "Is it true?" Thus empiricism regards it as illogical to make such distinctions as that between existence and subsistence, or between the "is" of identity, that of predication and that of membership of a class; and still more obviously illogical to say that there is something defective about "is" itself. These are

all attempts to get behind the proposition, to maintain—in words!—that we mean more than we can say.

Considering propositions as they occur in discourse, we find that they can be asserted or denied, questioned, proved or disproved. In saying, then, that whatever can be asserted can be significantly denied, *i.e.*, that there are no undeniable truths, and that whatever can be asserted or taken for granted can also be made a subject for inquiry, can be questioned or proved, *i.e.*, that there are no unprovables, we are conveying certain characters of the common “is” of discourse (certain conditions of existence). In particular, there is no question of its indicating “necessity” as something over and above actuality. As related to other propositions any proposition has what we may, if we like, call “contingency”; but at the same time, as distinct from other propositions, as being a proposition and therefore requiring separate statement, any proposition has “absoluteness.” The forms of assertion, denial and implication being precisely the same in relation to the supposed different kinds of “is,” there is no way of establishing the difference. We can *say* that certain truths are of the peculiar “necessary” sort, just as we can say that no truths are “absolute,” but in both cases our speech bewrayeth us.

Rejecting in this way the distinction between necessary and other truths, empiricism takes up the position that in discussion or inquiry any proposition can be treated as (a) a conclusion to be proved from premises accepted, (b) a premise accepted to be used in proving some conclusion, (c) a hypothesis to be tested by the observation of the truth or falsity of the conclusions drawn from it, or (d) an observation to be used in determining the truth or falsity of conclusions drawn from a hypothesis. And if it be asked how it is determined which of these functions a proposition is to have, the empirical answer is that this is determined in discourse. Discourse depends on what the parties to it *believe*. If you deny what I assert, I may try to prove it by means of other propositions you admit; if we both agree on some propositions, we may set out to see what follows from them; if we are doubtful about any proposition, we may test it by its consequences. In general, discourse is possible when and only when persons come together who (a) agree about something, (b) either disagree, or wish to inquire, about something else. This position itself implies a common logic of assertion, implication and, I should add, definition. Apart from that logic, actual beliefs and observations are all that can be appealed to, and without them the process could not go on. Each of us (not excluding those who take a false view of logic) directs his inquiries and establishes his conclusions, in

greater or less disagreement with others, by means of this mechanism of individual statements and particular inferences. The person who holds that there are higher truths has still to draw lower conclusions from them in the ordinary way (as it is inferred, *e.g.*, from the "moral government of the universe" that a man is not dead after he has died); he who holds that there is a total truth can only advance towards it step by step. We have all to rely on what we find to be the case; unless we could say that a certain thing is *so*, we could not begin to discuss or inquire. And all this implies, I maintain, that science depends entirely on observation, *i.e.*, on finding something to be the case, and on the use of syllogism, either for proof or for testing; or, more generally, on observation in connection with, and in distinction from, anticipation. This means that there is no distinction between empirical and rational science. Since everything that can be asserted can be denied or doubted, since deduction and hypothesis are always possible, all sciences are observational and experimental.

II.

We may take for example the science of geometry which, like other mathematical sciences, has been regarded as "rational." It has been commonly alleged that over and above the truths stated in geometrical theorems there are certain "first principles" of the science which in themselves are unprovable, and that the whole science follows from these principles. Leibniz has given classical expression to this position in the statement (*New Essays on the Understanding*, Bk. IV, Ch. I) that "it is not the figures which make the proof with geometers. . . . It is the universal propositions, *i.e.*, the definitions, the axioms, and the theorems already proved, which make the reasoning, and would maintain it even if there were no figure." The proof of the last-mentioned theorems, of course, comes under the same general statement, and so we find that the whole science depends on axioms and definitions, supposedly identical propositions, *i.e.*, propositions which cannot be significantly denied or conceived to be false. This position Leibniz expresses by saying that these propositions follow from "the principle of contradiction," which therefore has embodied in it the whole of geometry and of rational science. It empowers us to reject all propositions which "involve a contradiction" and to affirm their contradictories—which neglects the fact that if a "proposition" were unintelligible, we should not know what its contradictory was.

The attempt is, in fact, to derive geometry from the notion of incompatibility or of the difference between truth and falsity. But obviously this notion could not provide us with the notion of a triangle or any other matter that geometry

treats of. In order to find out that having interior angles together greater or less than two right angles is incompatible with triangularity, we require to have the specific things, triangles, before our minds. Apart from observation we could make no assertion of incompatibility whatever. To say, for example, that black is incompatible with white "because it is black" or "because it is not white" is, in either case, to presume the very thing to be proved. In demonstrating the analytic or necessary character of the proposition we surreptitiously introduce the synthetic relation, the fact. "If triangles were not X," says the rationalist, "they would not be triangles." Why? we ask. The only possible answer is "Because triangles *are* X." The fact is required, and the "principle" adds nothing to it. We agree that in a sense the figures do not make the proof; men had known triangles long before they had raised the question of the sum of their angles. But without the figures there would be no proof, because there would be nothing to talk about. No more need be said to demonstrate the falsity of the view that geometry follows from axioms and definitions.

It is curious that, all the while that geometrical truths were regarded as having an ideal or rational character owing to their derivation from pure identities, application of them was made to physical phenomena. Yet, if they had not been synthetic, if they had not conveyed information which it was quite possible not to have about things of certain types, they could not have been applied at all. It is no answer to this argument to say that all that was required, in relation to the physical facts, was something approximately correct, something good enough for practical purposes. This is to say that geometrical truths could be treated as physical hypotheses; which would have been impossible unless there were definite points of contact between the geometrical and the physical. We could not say "Let us suppose this object to be triangular," if triangularity were a "rational" entity and the object a "natural" one; and we could not go on to say "The object must then have certain other properties, and these do not differ greatly from the properties we observe it to have," unless we could make a direct comparison between the two sets of properties. Even in *supposing* that a physical object has geometrical properties, we imply that there is no difference of order between physical and geometrical objects, that physical objects do fall within the field of geometry. Thus our geometrical hypotheses, or our hypothetical geometry, might actually be falsified by physical facts. If any such contradiction arose, the conclusion would not be that physical facts had failed to come up to geometrical requirements; it would

be that our geometry had to be revised. The logic of application is simply the logic of syllogism; and if a geometrical theorem and a physical observation together imply the contradictory of a physical observation, we are as much entitled to question the theorem as to reject the observations. And if careful observation continues to give us the same results, we are bound to deny the theorem. This position will only appear arbitrary and out of harmony with our actual scientific procedure, to one who does not realise that our geometrical theorems are themselves the results of careful observation. But since, whether the conclusion be false or not, a theorem and a fact can together imply nothing unless they have a common term, we are bound to say that the fields of geometry and of physics are not cut off from one another, and that the two sciences are on the same empirical level. This conclusion will apply, however far "rational physics" may be carried. At some point there must be contact between "truths of fact" and "truths of reason"; as is sufficiently established by the fact that we know them both. And that which is capable of implying a fact is equally capable of being falsified by a fact.

It is on the basis of the view that geometry is hypothetical and so, by a curious perversion of the meaning of the term "hypothetical," unaffected by fact, that the various "geometries" have been set up. Thus we are told that we can obtain different geometries according as we assert or deny Euclid's "axiom of parallels." Now no doubt different consequences will follow from the two contradictories, but it is our business to seek for errors in these sets of consequences, in order that we may determine whether the "axiom" is true or not, *i.e.*, whether as a matter of fact two intersecting straight lines can or cannot both be parallel to a third straight line in their plane. It is certainly a merit to have seen that Euclid's axiom can be denied, but what is then demanded will be either a testing of it by its consequences, or a deduction of it (or its contradictory) from propositions which we find to be true, or a direct statement that we find *it* to be true (or false). Instead of this, other propositions have been retained as axioms, and it is made a matter of choice whether we accept the proposition on parallels or not; and thus we have the various "geometries" and "spaces." And this position is even combined with the admission that the geometries which reject the axiom have to define the straight line differently; which is really an admission that Euclid's proposition is true, and incidentally one which could not be made unless there were straight lines which answer to Euclid's description.

Bertrand Russell, in his "Foundations of Geometry," does not make this admission; but he only avoids it by bringing in (p. 173) a reference to spherical space, in which, while "in general" it is true that there can be only one straight line between two points, in the case of antipodal points this is not so. Since the distance between such pairs bears a special relation to the constitution of the space in which they are, "it is intelligible that, for such special points, the axiom breaks down, and an infinite number of straight lines are possible between them; but unless we had started with assuming the general validity of the axiom, we could never have reached a position in which antipodal points could have been known to be peculiar." Russell appears to use the word "general" in some private and personal sense. The natural conclusion would seem, however, to be that since the axiom is *not* generally valid, we have not reached a position in which antipodal points are known to be peculiar, and so no exception to Euclid's axiom has been discovered. It is also noteworthy that "unless we have started with assuming" Euclid, there would not have been terms in which to describe the "non-Euclidean" geometries and spaces. It appears to be the case that such geometries are only Euclidean geometry with different terminologies. As to the disputed proposition on parallels, it can be proved by assuming that the sum of the interior angles of a triangle is equal to two right angles. As it is employed in Euclid to prove the latter proposition, we are faced with circularity of reasoning. But the proposition on the angles of a triangle can be independently proved, if we assume that direction and difference of direction (angle) mean the same at different points; failing which there can be no question of the *sum* of such angles.

Waiving this point, however, we shall find it profitable to consider Russell's general argument. There are, he says (pp. 200, 201), certain "*a priori* axioms" which are "necessarily true of any form of externality"; but this leaves some of Euclid's "axioms," including the proposition on parallels and that two straight lines can never enclose a space, to be "regarded as empirical laws, derived from the investigation and measurement of our actual space, and true only, as far as < the two mentioned > are concerned, within the limits sets by errors of observation." In other words, it is only by observation that we can determine whether our actual space is Euclidean or non-Euclidean. (Russell admits that we have an actual space; no doubt to save the possibility of physical applications. Nowadays this is not considered necessary, and we have the utterly illogical theory of relativity according to which nothing is "actual" and "is" has no meaning.) But

there are still the *a priori* axioms (axioms proper) which are not empirical laws but are necessarily true of any form of externality. In considering this position we have to ask how, except by observation of actual externality, we discover what is true of it or what is "deducible from the fact that a science of spatial magnitude is possible" (p. 175); how this deduction proceeds, so as to enable us to distinguish what is true of experienced space and what is necessary to any form of externality; how, in fact, we can distinguish in space those characters which make it external from its other characters. Russell wishes to show that there are, or may be, forms of externality which, having certain characters of the form which we have observed, do not have others. But in order to show this he must point to forms which do not have the latter characters. If space is the only form of externality that we know, then all the forms that we know have all the characters of space. In order to distinguish characters which are essential to externality from others which are accidental, we shall have to say that in the case of the former we can "see the connection" and as regards the latter see that there is no connection. In other words, necessary connections between some of its attributes and necessary disconnections between others are among the characters of space. To justify this conclusion it would have to be said that we had grasped by a single act of thought *all* the characters of externality in general and of our actual space in particular. Such a position ignores the possibility of discovery and the nature of deduction.

The question is, then, in what way the view that "all forms of externality are X, Y, Z" but "some possible forms of externality are not A, B, C," *i.e.*, are not Euclidean, can be supported. X, Y, Z, the *a priori* axioms, are supposed to follow from "analysis" of externality. But this analysis can only proceed by simply finding certain characteristics of externality. If analysis were taken to show the necessity of these characteristics, then this necessity in turn would be a characteristic which was simply found. In short, Russell's "deduction," which is supposed to demonstrate necessity, can only start from, and proceed in terms of, observation of actuality. Similarly when he says (p. 62) that "those properties <of the form of externality> which can be deduced from its mere function of rendering experience of interrelated diversity possible, are to be regarded as *a priori*," his position is quite illogical. The properties of interrelated diversity can be discovered only by examining situations which exhibit interrelated diversity; so that not only are the premises and the conclusions of the supposed deduction *identical* (*viz.*, all

things which render experience of interrelated diversity possible are X, Y, Z), but nothing is said to show that Euclid's axioms are not equally "*a priori*," since Euclid claims that they indicate properties which he finds in such situations, *i.e.*, in the only interrelated diversity he knows. In fact, the question is solely of "empirical laws." This is partly obscured, not only by the reference to "deduction," but also by the reference to "experience" of interrelated diversity. But all the propositions in question are about what is diverse and interrelated, and nothing about experiencing really enters into the argument.

Russell makes a great point of the "logical consistency" of non-Euclidean systems. Here again he is assuming that he knows "all about" such systems, or that he has the peculiar privilege of declaring what is to be regarded as assailable and what as unassailable. We have to note two distinct senses in which consistency and inconsistency are spoken of. There is inconsistency in fact; two propositions are said to be inconsistent when one, with a fact or a number of facts, implies the falsity of the other, *i.e.*, when the two together, with or without certain facts, imply a false proposition. This cannot be determined by taking the propositions by themselves but only in relation to facts. But two propositions, inconsistent in this sense, may be perfectly consistent in the other sense, *viz.*, that neither by itself implies the falsity of the other. Now consistency in the latter sense is of the very slightest importance as a description of a group of propositions. Limiting ourselves to that group we find no member of it disproved by any other or collection of others. But there is nothing scientific about limiting ourselves to such a group, allowing them to "define" a science. We ought, on the contrary, to bring them into relation with every available fact, so that any real inconsistency will appear. Russell cannot say that both Euclidean and non-Euclidean geometries are consistent in the broader sense; so that the consistency he claims for non-Euclidean geometry is a barren distinction.

We conclude, then, that geometry is, like all others, an empirical or experimental science dealing with things of a certain sort, that there is nothing "*a priori*" about it but that it is concerned throughout with fact. When Russell says (Principles of Mathematics, p. 5) that pure mathematics asserts "merely that Euclidean propositions follow from the Euclidean axioms, *i.e.*, it asserts an implication; any space which has such and such properties has also such and such other properties," he is again using "implication" in his characteristically loose way, and he omits to indicate that these facts can be discovered only if we can examine a space having

"such and such properties." Geometry, we may say, is concerned with empirical characters and relations of things in space and is a practical science, and Euclidean geometry consists not of "implications" but of propositions (connected to some extent, of course, by argument) which are either true or false. We can say that, if there were no externality, no geometrical propositions would be true, just as we can say that if there were no distinction between truth and falsity, no propositions whatever would be true. But these statements do not help us in the least to discover any proposition, geometrical or other, which is true. To call them, therefore, statements of the *implications* of the form of externality and of the principle of contradiction is the sheerest absurdity. We must rather say that, since these "principles" have no practical consequences, *there are no such principles*. Our sole concern in science is with facts, and we can attach no meaning to the suppositions "if there were no externality" and "if there were no distinction between truth and falsity"; they cannot even be *conceived* to be facts, that is, they cannot be supposed.

III.

We have found that the conditions of discourse and inquiry demand the rejection of "pure" science and the assertion that all sciences deal with facts, in relation to which we assert or deny, prove or suppose. We have found, in other words, that the theory of different ways of being is untenable. But with it falls the theory of different ways of knowing, the distinction between sense and reason. The very slightly empiricist character of the work of those philosophers who are called "the English empiricists" is accounted for by their still making this very unempirical distinction. In maintaining that all our knowledge is derived from sense (a position which, on account of their rationalist preconceptions, they by no means maintained consistently) they took a view of sense which was dependent on its having been regarded as an *inferior* way of knowing. It was supposed to provide isolated data, materials which reason had to shape into, or subordinate to, the coherent system of knowledge which we call science. And Hume, while admitting that no such coherence *could* be imposed upon isolated data, still maintained that the data of sense were isolated, and accordingly could not show how science is possible. The rejoinder of idealists like Green that Hume's position leaves out of account the function of the mind as a relating agency, that it takes as real what has not yet been made real by the work of the mind, is no reply. Hume's argument is precisely that neither mind nor any other agency could possibly perform such work on "distinct

existences." And this is the point of departure of the "radical empiricism" of James. Mind is not required to relate things, because things are given as related just as much as they are given as distinguished. Connections and distinctions, in fact, are given together; and those who argue that the work of the mind is required to connect distinct things, might equally well maintain that work had previously been required to distinguish them. Here James is drawing attention to the important fact (important, as well as for other reasons, in view of the persistent misunderstanding of the meaning of empiricism) that there is nothing in the least empirical in the conception of a "distinct existence." It is on the contrary the rationalist conception of "essence" masquerading as a fact of experience.

If, then, there is to be any question of what is given or presented (though it would be better to speak of what is observed), connections must be included. This is in line with the view already set forth that what can be contemplated or enunciated is always in the form of a proposition; in other words, that we deal always with complex states of affairs and never with "simple entities." Any theory which refers to the work of the mind, or to rational factors, as contributing, along with sensible or given factors, to making things intelligible, is self-refuting or "unspeakable." If whatever is intelligible has both connections and distinctions, then in order to speak intelligibly of what is contributed by the mind we shall have to assume that it has both connections and distinctions, and in order to speak intelligibly of what is given by things we shall have to assume that *it* has both connections and distinctions, so that no "work of the mind" is required to make it intelligible. And in the same way, in speaking intelligibly of "knowledge," we are speaking of a certain state of affairs, the mental process which knows, as connected with and distinguished from another state of affairs, the process or situation, mental or non-mental, which is known.

We cannot, then, make any such distinction as that between "things as we know them" and "things themselves." Unless the former *are* things themselves, we are not entitled to speak of things (and hence to speak) at all. On the other hand, we are entitled to reject, by reference to things themselves, *viz.*, the things we know, any suggestion of an agency whose operation cannot be detected; which we cannot observe acting on some observed situation and bringing about observable changes therein. As "rational factors," *ex hypothesi*, cannot be seen at work (since they must have worked before anything can be seen; since they are "conditions of the possibility of experience"), not only can we not assert that there

are such ideal entities, but we cannot show what they would do, if there were. An agency whose presence cannot be detected is an agency which it is of no advantage to postulate, as Berkeley showed in regard to Locke's "matter." We cannot have a "merely inferential" knowledge of it. We must be able to say: "This is the sort of thing which under certain circumstances will act in such and such a way, and under other circumstances will act in a different way." But if we have never observed it so acting, if we have never been able to distinguish it from its effects on the situation, then the whole content of our knowledge, all that we are in a position to speak about, consists of the circumstances, no longer to be described as effects of "it," at least. The appeal to inference, or to the distinction between "knowledge by acquaintance" and "knowledge by description," is futile. We can say, for example, that any man we happen to meet had parents; we can have an indirect knowledge of their existence, though we have never seen them. But this would not have been possible if we had not at some time known individuals who stood in that relation to some one, and had not thereafter come to believe that all beings of a certain sort have parents. We cannot, then, by inference from what we observe, conclude that there is a mind whose function it is to observe these things, *i.e.*, which is purely instrumental, a pure agency. Unless we have observed minds, we cannot speak of them. Having observed them, and having observed that they are related by "knowledge" to other things, we can also consider how they fall into error. But this criticism of the mind's operation in regard to things cannot take the form of "criticism of the instrument." We cannot, without self-refutation, undertake to criticise the mind's entire knowledge; for it is by our knowledge that we criticise. Criticism, then, can only proceed by our asserting what we find to be the case; we can criticise propositions only by means of propositions, similarly asserted. The distinction of ways of knowing, at least in the form of a distinction among *faculties*, is therefore untenable. We can, of course, distinguish such attitudes as asserting and supposing. But in every case we are dealing with something which is, or may be, found to be the case, and there is no question of seeking for and fostering some superior instrument.

In terms of this theory it must be said that in psychology, and likewise in ethics, our knowledge is observational and propositional. The question is of psychological and ethical facts, and not of an ultimate agency or ultimate standards. These sciences, like all others, are nothing if not empirical and experimental. This does not, of course, mean that minds must be studied in a laboratory; they show some of their

characteristics better in *other* social situations. Love, for example, is a very important psychical phenomenon; in fact it may be said that no one can know much about minds who has not taken it into account. But none but the most hardened "experimentalist" will claim that a laboratory is the best place for getting to know its characters and conditions. The main point is that, in order to know minds, we have to observe them and *think* about them. There is no real distinction between thinking and experiment. In each case we require some hypothesis, and in each case we test it by reference to what we believe, or find, to be the case, *i.e.*, by whether or not its consequences are in accordance with facts which we know. In holding that in order to know minds we have to look at them, empiricism is not opposed to "introspection," the study of our own minds, though it opposes the supposition that in this peculiar case the process which knows and the process which is known are identical; *i.e.*, it insists on the fact that the study of our own minds takes place by means of observation. But, an empiricist will say, there is no more reason for confining ourselves to "introspection" than for considering only our own bodies in studying physiology.

What has chiefly to be emphasised, however, is that the observation of minds, the knowledge of them in propositions, requires the rejection of the "unitary" view of mind, the conception of it as having only one character and being self-contained in that character. That is a rationalistic, "unspeakable" view. If we are to have any dealings with minds, we must be able to consider how they act in different situations, *i.e.*, to consider them as having complex characters and activities, as being divisible and determinate. Psychological science will only be possible if we have a variety of psychological truths, between which, and in each of which, connection and distinction are discernible. And the same applies to ethics. These sciences are historical, they are studies of occurrences and activities, they are concerned with situations in space and time. I have thus, without going into detail, indicated the place in the empiricist scheme of the other anti-rationalist theories I mentioned. The general conclusion is that all the objects of science, including minds and goods, are things occurring in space and time (the only reason for regarding minds as not in space being the rationalistic contention that they are indivisible), and that we can study them by virtue of the fact that we come into spatial and temporal relations with them. And therefore all ideals, ultimates, symbols, agencies and the like are to be rejected, and no such distinction as that of facts and principles, or facts and values, can be maintained. There are only facts, *i.e.*, occurrences in space and time.

PERSONALITY, FROM THE STANDPOINT OF THE PSYCHIATRIST.¹

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THE problem of personality is one which forms common ground for philosophers, psychologists and psychiatrists and is receiving great attention from the last.

Francis Bacon, who recognised that a proper understanding of the mind must form the basis of scientific treatment, advocated the study of personality and wrote (*De Augmentis*): "Not, however, that I would have their characters presented in *Ethics*, as we find them in history, or poetry, or even in common discourse, in the shape of complete individual portraits, but rather the several features and simple lineaments of which they are composed and the various combinations and arrangements of which all characters whatever are made up, showing how many and of what nature these are, and how connected and subordinated to one another so that we may have a scientific and accurate dissection of minds and characters, and the secret dispositions of particular men may be revealed: and that from a knowledge thereof thereby better rules may be framed for the treatment of the mind. And not only should the characters and dispositions which are impressed by nature be received into this treatise, but those also which are imposed upon the mind by sex, by region, by health or sickness, by beauty, deformity and the like; and again those which are caused by fortune as sovereignty, nobility, magistracy, privateness, prosperity and the like."

More recently Henry Maudsley wrote (*Pathology of Mind*): "No more useful work could be undertaken in psychology than a patient and scientific study of individuals—the scientific and accurate classification of the minds and characters of particular men in connection with their features and habits of body. How vast a service it would indeed be to have set forth in formal exposition the steps of the quick process by which the shrewd and experienced man of the world intuitively judges the characters of those he has to do with, and refers them in a moment, instinctively, to their proper classes in his mind."

To what extent are these hopes being fulfilled? The description of individual types and the epitomising of personal qualities have for centuries remained the province of men of

¹Part of a paper read at the Fifth Annual General Meeting of the Australasian Association of Psychology and Philosophy, 20th May, 1927.

letters, of poets and novelists, dramatists and biographers, and the authors of inscriptions upon tomb-stones: the scientific study of personality is yet in its infancy. Psychology, so long preoccupied with the investigation of isolated mental functions, has only just entered upon the study of the wider aspects of behaviour and is leaving the laboratory for the factory and the market-place. Philosophy gropes for the formula which shall explain the mystery of creation and attempts to get at the deeper reality of things. Psychiatry in more recent developments has attempted to join hands with other biological sciences and has made remarkable progress, not only in the interpretation of the abnormal, but also in contributing towards the understanding of the normal. That the borderland between normal and abnormal is hard to define is a truism which needs no repetition. It is a territory disputed both by psychology and psychiatry and raises many mutual problems.

Man's study of himself has been sadly hindered by the dualistic theories which have held sway for so long. From the first speculations as to the mysteries of death and sleep there grew the conception of soul and spirit as entities quite distinct from the body, a conception which has dominated thought up to the present time. Yet many of the older philosophers held a monistic conception. For example, Lucretius wrote (*De Rerum Natura*): "The mind in which dwells the directing and governing principle of life is no less part of the man, than heart and foot and eyes are part of the whole living creature . . . the nature of the mind and soul is bodily." And again: "The mind is begotten along with the body, grows up together with it and becomes old along with it."

When we approach the study of personality we are faced with the difficulty of deciding what we shall include in our research. "Persona" is the actor's mask. Perhaps it will be correct therefore to include in personality everything that is concerned in the expression of the individual, in the activation of that subtle vital impulse which is implanted in the human organism. In short, personality will comprise both the bodily and mental constitution of the individual, and will include not only the Ego or sense of individuality (described by McDougall as the self-regarding sentiment), but also character comprising the outstanding sentiments and dispositions which, indeed, may vary from time to time. In practice, one finds a considerable degree of confusion between the terms "personality," "ego" and "character." According to Kant character implied a "consciousness of self-control in accordance with fixed principles." Münsterberg described it as "the

power to keep the selected motive dominant throughout life." For Shand character is built up out of sentiments, a conception similar to that of McDougall, who says: "The organised system of the conative tendencies of our instincts directed upon a variety of objects and towards the realisation of various goals connected with these objects constitutes what we call character. Character is the system of directed conative tendencies" (Outline of Abnormal Psychology).

Ward (Principles of Psychology) held that: "The degree of development as personality rather than variety or fixity of type is the one thing of essential moment in the formation of character," and continued by pointing out that development in the animal scale is associated with increasing powers of initiative and selection, until in man "character shows itself rather in a certain adjustment of external relations to internal relations, in other words, the end here is the self-conscious realisation or betterment of self." Ward emphasised the qualities of stability and of originality in aim as the essentials of personality. Certain other contributions from psychology might be mentioned. James outlined levels of conduct, a level of instinctive tendencies connected with the bodily needs, above which in order are the levels of the bodily, social and spiritual selves. A somewhat similar conception recognising different aspects of the personality occurs in Wernicke's somato-, auto- and allo-psychic functions. But Dr. A. H. Martin has dealt so thoroughly in a recent paper with the psychological aspects of personality that I will pass on to consider some contributions from the clinical side. At times one feels with Goethe:

"Grey, friend, is every theory,
But green life's ever-living tree."

Present day psychology and psychiatry are specially concerned with the study of the individual in action and with the investigation of the motives that underlie his conduct. This is a dynamic conception.

Janet has drawn up a scheme of mental functions according to the degree of adaptation to reality and practical ends:

Hierarchy of Functions.

1. Function of the Real.

Action, efficient and well-adapted.

Attention, perception of reality with certitude and belief.

Emotion, adapted to the present moment.

2. Disinterested activity.

Activity without full consciousness.

Habit.

Partially adapted activity.

Perception without certitude.

3. Function of imagery.

Imagination and reverie.

4. Level of visceral-emotional reaction.

5. Level of ill-adapted, useless movements.

The symptoms of incompleteness, as they are termed by Janet, the sense of inefficiency, the complaints of inability to concentrate and the like, are due to a lack of synthesis and harmony in the "make-up" of the neurotic. Janet distinguishes certain degrees of this lack of synthesis in neurosis, which in its most dramatic form appears in the dissociated states, the trances, somnambulisms and alternating personalities of hysteria. Janet's conception of a psychological tension which keeps the personality well adapted to reality but which is subject to temporary or permanent decrease in potency thereby leading to disintegration and "lower" types of behaviour, has considerable practical value and is related to certain other conceptions which will be outlined later.

From Janet we pass on to Freud. The general principles of the psycho-analytic school are sufficiently well known to need no description here, but I would call attention to some recent developments which have a more intimate bearing on my theme. Various character traits have been traced by the analysts to fixations at the different stages of libido development. According as libido becomes extraverted towards other individuals so does the personality attain development towards full efficiency, freed from the ties of infancy. In so far as libido suffers an arrest of development, fixation at the stage of auto-eroticism, the stage in which libido is weak and lacks a definite aim, or at the stage of narcissism where the libido is active but is lavished upon its possessor, or at the stage of allo-eroticism with its various degrees of extraversion, so does the whole personality fail to mature. A number of character traits, in particular orderliness, thrift and obstinacy have been traced by the Freudians to arrest and deviation of libido development. Other libido fixations are held to form the basis of the sadistic and masochistic components of the personality (pleasure derived from the infliction and experience of pain) with their various reaction formations.

With these observations which belong to the earlier phases of the psycho-analytic movement, I am not specially concerned as they deal only with aspects or side-lights of personality. In the recent work of the Freudian school the focus of attention has shifted somewhat from the study of libido fixation to the consideration of personality in its wider applications

of the adaptation of the individual to his social environment. In "Das Ich und das Es" Freud has attempted a more precise description of the components of personality, which is summed up in the following extracts: "In the Ego perception plays the part which in the Id devolves upon instinct. The Ego represents what we call reason and sanity in contrast to the Id which contains the passions" (p. 28, English translation). In a later passage he says: "By virtue of its relation to the perceptual system it (the Ego) arranges the processes of the mind in a temporal order and tests their correspondence with reality. By interposing the process of thinking it secures a postponement of motor discharges and controls the avenues to motility." Above the Ego there is the Super-ego, or Ego-ideal, derived from the emotional dispositions of the individual and his identifications with parents and others in authority in the early, impressionable years of infancy and childhood which are of paramount importance in determining the attitude of the individual in his social adaptations, his cultural moral, religious and other aims.

It is of considerable interest to note that Freud's conception of the function of the Ego as the awareness of temporal sequence and the controller of motor discharges, agrees with the neurological conception of the functions of the *cortex cerebri* as maintaining accurate contact with reality and appreciating temporal and spatial relations and controlling the lower levels of emotional impulsive reactions. We are reminded, too, of Janet's "function of the real." In regard to the Ego-ideal Freud says further: "The effects of the first identifications in earliest childhood will be profound and lasting—behind the origin of the ego-ideal there lies hidden the first and most important identification of all, the identification with the father." In this recent work Freud takes more account of the inherited substratum, of the possibility of reaction patterns derived from the experience of the race (compare Jung's conception of the unconscious) than I am aware of in earlier psycho-analytic writings. To quote again from the same source (p. 48): "Through the forming of the Ideal, all the traces left behind in the Id by biological developments and by the vicissitudes gone through by the human race are taken over by the Ego and lived through again by it in each individual. Owing to the way in which it is formed the Ego-ideal has a great many points of contact with the phylogenetic endowment of each individual and his archaic heritage. And thus it is that what belongs to the lowest depths in the minds of each one of us is changed, through the formation of the Ideal, into what we value as the highest, the human soul."

One may summarise Freud's conception of personality as consisting of an instinctive component the Id, out of which arises the Ego, the bodily self, material and sensual in outlook, and the Super-ego or Ego-ideal, the highest component, in which development proceeds. Thus is personality based upon past and present in preparation for the future. A similar formulation is contained in Bergson's "Creative Evolution."

According to Jung the motivation of human conduct is largely influenced by the individual and the collective unconscious. The individual unconscious, according to Jung, contains personal acquisitions and impressions derived from post-natal experiences which have for the most part been forgotten or repressed but which may be recalled into full consciousness, while the collective unconscious is a storehouse of primitive ancestral dispositions common to the race, of the "archetypes of apprehension" which determine the primitive symbolic mental functions, occurring in dreams and in certain psychopathic conditions. But we are more especially concerned with Jung's character types. He has described two main groups, the introverts and the extraverts. The introverts or individualists are activated mainly by their inner necessities, they consider first themselves and their attitudes towards external objects. In Jung's words: "Introverts are taciturn, impenetrable, often shy, natures who form such a vivid contrast to the open, serene, sociable maybe, or at least friendly and accessible characters (the extraverts) who are on good terms with all the world or even, when disagreeing with it, still hold a relation to it by which they and it are mutually affected." In addition to these two emotional or temperamental categories Jung distinguishes certain ideational types referred to the mental functions of sensation, intuition, thinking and feeling. The sensation type receives simple perceptions of reality and acts upon them without further elaboration. The intuitives act in accordance with their disposition or instincts in an "all or nothing" fashion. In both the sensation and intuition types, action is of the emotional-impulsive variety, and has been termed irrational or empirical. In the third, the thinking type, the individual is unable to enter upon a course of action without an intellectual and logical appreciation of the end to be attained. He is unable to make any adaptation to a situation which he cannot comprehend intellectually. The feeling type is guided largely by the pleasure-pain principle and interests are determined for the most part by moods. In the words of Jung (*Problems of Personality*, p. 297): "These four fundamental functions appear to me, as far as my experience goes, to be sufficient to express and represent the ways and means of conscious orientation. For

a complete orientation of consciousness all the functions should cooperate equally; thinking should make cognition and the forming of judgments possible; feeling should say to us how and what way a thing is important or unimportant for us; sensation by means of sight, hearing, taste, etc., should enable us to perceive concrete reality; and finally intuition should permit us to guess the more or less hidden possibilities and backgrounds of a situation, because these hidden factors also belong to a complete picture of a given moment. But in reality it is seldom or never that these fundamental functions are uniformly developed or correspondingly under voluntary control."

These psychological types of Jung are sufficiently difficult to understand without the added complication which comes when the intra- and extra-verted attitudes which accompany the fundamental functions of sensation, intuition, thinking and feeling are described as having unconscious compensatory reaction formations. This means that without the analytic procedure and an interpretation of the material so obtained, we are unable to determine the type of an individual. And it is the interpretation which forms the great stumbling block in the attempt to fit the individual into any definite category. Nor is it quite clear from Jung's writings what criteria are to be applied. We are nevertheless indebted to Jung for his analysis of certain psychological functions of which the whole personality is comprised, individual differences depending upon the varying development of one or more of these functions.

Another important development lies in the attempt to correlate physical and mental qualities. Kretschmer (*Physique and Character*, 1924) defines constitution as "the totality of all individual peculiarities which are referable to heredity, that is, which have a genetic basis" (genotype). Character is "the totality of all possibilities of the affective and voluntary reaction of any given individual as they come out in the course of his development" (genotype) including both inherited dispositions and bodily influences and the experiences derived from education and other contacts with environment. As regards temperament Kretschmer points to two leading physical determinants, the sense-brain-motor apparatus and the body-humour or endocrine system. In his words: "We shall be able to sum up under the notion of temperament such psychic events as experience teaches us to be particularly easily or frequently responsive to acute chemical activity in an exogenous nature (*e.g.*, effect of alcohol) or endogenous, *i.e.*, affectivity and general psychic tempo" (determined by the general state of the nervous and ductless glandular systems).

Kretschmer distinguishes two great temperament groups, the cyclothymics and the schizothymics. The first group includes the open, sociable, practical individuals who are well-attuned to their surroundings; they correspond to the extraverts of Jung. The second group, the schizothymes, are more complex personalities, reserved and sensitive, who find difficulty in getting into emotional rapport with their fellows, who exhibit qualities of stubbornness and tenacity, in contrast to the fickleness and easy adaptability of the cyclothymics. Kretschmer has correlated these temperamental characteristics with certain physical qualities. The cyclothymic disposition occurs most frequently in thick-set, rotund individuals (the laugh-and-grow-fat type, termed "pykniks"). Schizothymia is associated with a slender build, the narrow-chested slim type (asthenics) and with other varieties of physical habitus (schizoid).

The cyclothymics and schizothymics are well contrasted in the words of Shakespeare:

"Let me have men about me that are fat,
Sleek-headed men, and such as sleep o' nights,
Yond Cassius has a lean and hungry look,
He thinks too much; such men are dangerous."

While the physical aspects of these types of Kretschmer have been worked out in considerable detail and can be described in figures and ratios according to anthropometric methods, the mental correlation tends to elude comprehension and to depend upon the idiosyncrasy of the observer. So frequently psychometry in the widest sense of estimation and assessment of mental qualities, tends to be resolved into pen-pictures of considerable literary merit but of doubtful practical importance.

Kretschmer has done further service to psychopathology and to the study of personality in his delineation of the sensitive constitution (*sensitive Bezeihungswahn*) and its relation to delusion formation. He has contributed also to the understanding of Hysteria by pointing out the "naïve, under-developed psychic life" with its instinctive impulsive structure which lends itself so readily to expression in the form of primitive reactions, the tremblings, convulsive attacks, and panic responses to disturbing and unpleasant situations.

To-day the tendency in psychiatry is to bridge the gap between body and mind on either side of which the protagonists of physio- and psycho-genesis have waged such bitter warfare.

This leads me to give a brief account of Professor Adolf Meyer's attempt to harmonise in the conception of psychobiology the conflicting tendencies of those who approach the

study of the individual exclusively from the physical or from the mental aspect. In Meyer's words: "The human organism can never exist without its setting in the world. All we do is of the world and in the world. The great mistake of an over-ambitious science has been the desire to study man altogether as a mere sum of parts. . . . It was a long time before willingness to see the large group of facts in their broad relations as well as in their inner structure, finally gave us the concept and vision of integration which now fits man as a live unit and transformer of energy into the world of fact and makes him frankly a consciously integrated psycho-biological individual and member of a social group" (unpublished lecture).

I would call special attention to this idea of integration which underlies the teaching of a number of schools of psychopathology. It is over thirty years since that great English neurologist Hughlings Jackson formulated the conception of different functional levels in the nervous system and of the normal control by a highest level of integration over lower mechanisms

The hierarchy of mental functions described by Janet, and the construction of the Ego according to Freud, both take account of the principle of integration. When the personality is sick, disintegration occurs; lower mechanisms become released from control, consciousness (or attention) is weakened, adaptation becomes less perfect. One of the striking features of mental disorders, at any rate of the severe types known as psychoses, is the transformation and even absence of "personality." The mentally sick individual is like a nation in revolution without a representative head.

In a recent work (Holism) Smuts has put forward a plea for a unitary conception of vital phenomena. He traces out the increasing complexity of organisation in nature from matter recognised by physical and chemical qualities up to "minds or psychical organs where the Central Control acquires consciousness and a freedom and creative power of the most far-reaching character; and finally to Personality which is the highest most evolved whole among the structures of the universe and becomes a new orientative, originative centre of activity" (p. 86). Smuts declares that the "new discipline of Personology is destined to form the 'crown of all the sciences'."

In this brief survey of a number of different viewpoints I have endeavoured to show that personality may be conceived as a structure of increasing complexity in the study of which mind and body cannot be considered apart. Mind, after all, is only the highest form of functioning, mentation; it is a process, not a static quality. The individual is composed of

a body with various organs. First there is a vegetative level consisting of a system of glands and nerves regulating the bodily processes and with a considerable influence on the sense of well-being and mood. Secondly, there is the nervous apparatus which enables contact with environment to be made and maintained through the organs of special sense, the ear, eye, etc., by which experience is recorded and stored as memory and through which movements can be initiated and controlled to further the aims and desires of the individual. Upon the harmonious working of these various parts of the individual in relation to environment depends the development of personality. Without proper integration there can be no personality. As Ribot said: "*Le coordination c'est moi.*"

From various sources rays of light are being cast upon the problem of existence and with the development of knowledge about himself man may look forward to widening spheres of influence and to more perfect modes of reaction. Has not the poet told us:

"Self-reverence, self-knowledge, self-control,
These three alone lead life to sovereign power."

NOTES BY THE WAY.

VIII.

"But if our own experience of art is of value to us, then it is possible for us to communicate that experience to others so that it may be of value to them; as it is possible for the painter to communicate to others his experience of the visible world. If he denies this, once again he denies himself. He shuts himself within the prison of his own arrogance, from which he can escape only by a want of logic. But, further, if our experience of art is of value to ourselves, and if it is possible for us to communicate that experience to others, it is also possible for us to arrive at conclusions about that experience which may be of value both to ourselves and to others. Hence scientific or philosophic criticism, which is based not, as some artists seem to think, upon a fraudulent pretence of the critic that he himself is an artist, but upon that experience of art which is, or may be, common to all men. The philosophic critic writes not as one who knows how to produce that which he criticizes better than he who has produced it, but as one who has experienced art; and his own experience is really the subject-matter of his criticism. If he is a philosophic critic, he will know that his experience is itself necessarily imperfect. As some one has said: 'We do not judge works of art; they judge us'; and the critic is to be judged by the manner in which he has experienced art, as the painter is to be judged by the manner in which he has experienced the visible world. All the imperfections of his experience will be betrayed in his criticism; where he is insensitive, there he will fail, both as artist and as philosopher; and of this fact he must be constantly aware. So if he gives himself the airs of a judge, if he relies on his own reputation to make or mar the reputation of a work of art, he ceases to be a critic and deserves all that artists in their haste have said about him." (A. Clutton-Brock: *A Defence of Criticism (Essays on Art)*.)

DELINQUENCY.¹

By ARCHIBALD J. GRAY, B.A.,

SINCE 1921 research in the problem of delinquency among boys has been carried on from the psychological laboratory at The Teachers' College.

This paper is merely a tentative statement, and at best all I can hope to present is a general account of the nature of the research, certain facts based on an examination of the data collected during one period of the research, and certain general impressions.

A few words about the Children's Court may not be amiss. Delinquents of both sexes up to the age of 18 years, appear before the Special Magistrate at the Children's Court. They may appear there in the first instance or they may be committed from country and suburban courts. In certain cases of serious offence they may be committed for trial from the Children's Court. The Metropolitan Boys' Shelter at the Children's Court is an institution of the Child Welfare Department. It accommodates:

(a) Delinquents who may have been arrested and placed there pending the hearing of their case.

(b) Delinquents who may have been committed there for a few days by the Special Magistrate pending medical and mental examination, or a further hearing of their case.

(c) Delinquents who may have been committed to one of the institutions of the Child Welfare Department, *e.g.*, The Farm Homes for Boys at Mittagong and Gosford, or the Truant School at Guildford, and who may be awaiting transfer.

At his discretion the Special Magistrate may require any delinquent to be medically and mentally examined, and it is usual to remand the case for that purpose. Such examination is carried out by officers of the Medical Branch of the Education Department. During the last few years, through special arrangement with the Principal Medical Officer of the Education Department, it has been possible to carry out the psychological examination from the psychological laboratory at The Teachers' College. It must be understood that we do not examine every delinquent appearing before the Court. Through lack of general facilities we can guarantee to examine only a certain number, and the Special Magistrate is constrained to select for examination:

(a) Those delinquents whose offence he regards as serious, *e.g.*, stealing in its more serious manifestations, truancy and

¹ A Paper Read at the Annual Meeting of the Australasian Association of Psychology and Philosophy, Sydney, 1927.

general uncontrollableness, malicious damage, assault, etc.

(b) Those delinquents whose offence he may not necessarily regard as serious, but who, in his opinion, for special reasons, should be examined.

The examination is carried out in the Boys' Shelter, and the Special Magistrate is supplied with a statement of the boy's Intelligence Quotient, apparent scholastic attainments and general mental condition, together with such recommendations for treatment as may be deemed necessary. It will thus be apparent that the work has a twofold value:

(a) A research value, in that we are attempting to collect data along lines to be mentioned shortly.

(b) An immediately practical value, in that we are able to supply the Special Magistrate with information which will assist him in his judgment, offer certain recommendations for treatment, and in many cases offer advice both to parents and boys.

Usually 12 cases are set down for examination each morning, and the general procedure is as follows. The boys are assembled in the school room in the Shelter and examined by means of group tests of intelligence. The tests used, *i.e.*, Opposites, Completion and Analogies, are specially adapted from the scale of group tests standardised for Sydney children by Dr. Phillips. This examination, involving the marking of papers and tabulation of results, usually occupies about three-quarters of an hour. Those boys whose intelligence quotient falls below average are submitted to a more intensive examination, the scale of tests used in this case being the Australian revision of the Binet tests, standardised by Dr. Phillips.

Every boy, however, is interviewed individually, and a record is made of such information as is set out below. Some of this information is supplied by parents and is carefully checked by means of police reports and deposition statements.

(a) Name, age, address; father's occupation, wages, whether in regular employment or otherwise, if deceased the cause of death; mother's occupation other than domestic duties, if deceased the cause of death; number of boys and girls in the family, their ages, whether attending school, if in employment their wages and contribution to the upkeep of the home; number of children deceased and cause of death, religion of each parent and of the children, whether parents or subject attend religious services; whether parents are living together or separated; records are made, mainly from special reports, of the home itself, whether well ordered or otherwise, number of bedrooms, rented or owned, etc.

This will give a general idea of the kind of information sought in the first instance. It has proved invaluable in a thorough understanding of the case from the psychological point of view, apart altogether from its general economic and sociological value.

(b) Whether this is the boy's first offence, if not his previous offences are noted and records made of his treatment on previous occasions. The *boy* is then questioned about his offence, the time at which it occurred, whether in company with other boys, whether truantiing at the time. A record is also made of the boy's own explanation and whether he appears to appreciate the seriousness of the offence.

(c) The nature of his general interests, his hobbies, how he spends his leisure hours, the kind of literature he reads, his attendance at picture shows—whether alone, with parents or in other company, type of picture most appreciated; his sporting activities, if in a team of any kind; his ambition from the vocational point of view.

(d) In the case of school boys notes are made of the classes in which they are placed, whether or not they like school, reasons, particularly in the case of those who dislike school, favourite subjects. At this stage it is customary to direct certain general scholastic questions with a view to obtaining some general idea of the boy's scholastic attainments. This information is supplemented by school reports.

In the case of boys not attending school, notes are made of the age at which they left, whether they passed the Q.C., which class they were in; whether they attend or have attended Evening Continuation School; the number and nature of their occupations, details of remuneration, reasons for changing occupation, whether apprenticed.

(e) Notes are made of the boy's general appearance, dress, manner, alertness, speech, ability to answer questions, general attitude. In special cases it is necessary to obtain family histories from parents and special detailed history of the boy.

This will give a general idea of the type of examination carried out. All the material so obtained has proved invaluable in a thorough understanding of the case. In each case the report of the Medical Officer is available, and consultations are frequently held.

In the case of boys attending school, letters are sent to headmasters requesting such information as the following:

- (a) Marks obtained in the various subjects at the last examination.
- (b) Position in class.
- (c) Attendance.

(d) General attitude towards school—part taken in sport and in the general corporate life of the school.

(e) Special aptitudes, habits, etc.

In the case of boys who have left school within the preceding twelve months, similar letters specially modified to meet the needs of the case are sent to headmasters. In return we supply a statement of the psychological examination.

The response to such letters has been very encouraging. In almost every case the report has proved of considerable value, and in many cases lengthy reports throwing additional light on home conditions have been received.

It must thus be apparent that a very full record is available for each case. To sum up, the record contains:

(a) Court history, deposition and police statements, and in some cases special reports on home conditions made by an officer of the Court.

(b) Medical examination.

(c) Psychological examination.

(d) Case history including family and personal history obtained from parents or guardians and from the boy himself.

(e) School report.

(f) In some cases special "follow up" reports from schools, employers or chaplains.

As a result of this examination the Special Magistrate is supplied with a statement of the boy's Intelligence Quotient, any information calculated to throw light on the case, and any recommendations for treatment which in general take the following form:

(a) In some few cases that the boy be detained for observation and further examination, or pending consultation with the medical officer or for examination by a psychiatrist.

(b) In doubtful cases of feeble-mindedness that the boy be specially examined with a view to recommending his being placed in an institution for the feeble-minded.

(c) In some cases of boys who have left school, that they be released on probation and be required to attend an Evening Continuation School or Technical College. Such recommendation is contingent on the boy's willingness to attend.

(d) In some cases of backwardness in boys of school age, that the boy be released on probation and required to attend a special class for backward children in one or other of the city schools where such special classes have been established. Distinct limitations are placed on this valuable mode of treatment on account of the fact that there are

only about twelve such classes scattered through the city and each class is limited to 15 children. A boy who might benefit materially from such treatment often lives at too great a distance from a school in which there is a special class.

(e) In some cases that the boy be required to enrol in another school if possible.

(f) In some cases that the problem of employment be considered by the Court officer or chaplain or other responsible person, and that where possible "follow up" work be done.

So far as lies within his power the Special Magistrate is prepared to consider such recommendations and if possible give effect to them.

Let us now consider certain available data. Again let me remind you that general conclusions cannot be drawn from such figures as are given, because the research is incomplete. All I can give you is some notion of the type of material available. The period selected for consideration extends from February 8th, 1926, to June 30th, 1926, roughly five months, and this period was selected simply because some of the records pertaining to this period had been worked out.

The total number of cases examined was 161, classified as follows:

	Under 14 Years.	Over 14 Years.	Total.
Boys attending school	76	6	82
Boys not attending school	2	77	79
Totals	78	83	161

The age range of the 161 cases is as follows:

Year	8	9	10	11	12	13	14	15	16	17
Number	5	2	9	20	16	26	24	24	15	20

Since the group scale of intelligence tests was not used as a routine method of examination until 18th June, 1926, practically all these cases were examined individually. Excluding three cases in which the group scale was used, we will consider the distribution of the Intelligence Quotients of the remaining 158.

Intelligence Quotient.	Number of Cases.
Below 70	6
70 to 80	13
80 to 90	18
90 to 110	108
110 to 120	9
120 to 130	2
Above 130	2
Total	158

This table would seem to indicate that:

(a) Of the total 158 cases, 121 or roughly 77% were either of average or above average intelligence, *i.e.*, had Intelligence Quotients above 90.

(b) Of the total 158 cases, 31 or roughly 20% were dull or backward, *i.e.*, had Intelligence Quotients between 70 and 90.

(c) Of the total 158 cases, 6 or roughly 3% were so backward as to be suspected of being feeble-minded, *i.e.*, had Intelligence Quotients below 70.

It is interesting to note that:

(a) Of the 82 boys attending school, no fewer than 16 had their Q.C., and of these 12 were attending Junior Technical Schools and two were attending High Schools.

(b) Of the 79 boys not attending school, 14 had their Q.C., and all of these had benefited by some form of secondary schooling.

(c) Of the total 161 cases, 30 had their Q.C., and neglecting those 36 below the age of 12 years who could hardly be expected to have gained the certificate, we find that 30 out of 125 or 24% had their Q.C.

1. Of those 6 boys in whom backwardness was so great as to appear indicative of feeble-mindedness, let us select two for brief consideration.

CASE 128.—A boy, aged 11 years 8 months. Charged before the Court in September 1925 as an uncontrollable child—released on probation. Present charge “uncontrollable, breach of conditions of probation.” Father, a labourer, of unsatisfactory character. Mother, domestic duties, of good character. Five other children, three girls, aged thirteen, nine, two years; two boys, five years and a few months respectively. Father addicted to drink and not in regular employment—does not provide the family with adequate food. Mother a sick woman, out of hospital against medical advice. Home surroundings very unsatisfactory. They owe a considerable sum for rent and have received assistance from benevolent societies. Father ill treats the mother and twice has injured this boy, on one occasion the boy had to have several stitches inserted in his face.

The boy is in second class at school, but truants very frequently. The medical report shows that he has very defective teeth, very defective nutrition and badly discharging ears, giving rise to defective hearing. His speech is good, but he cannot read. His I.Q. is 65. Under better home conditions and in one of the special classes, after his physical defects had been remedied, he should make definite progress.

CASE 19.—A boy, aged 12 years 3 months. A premature child, weighed three and a half pounds at birth. Up till three months little hope was entertained for his survival. At nine months he had pneumonia with constant bronchial trouble while teething. Walked at eighteen months, but did not talk till two and a half years, and until he began school his speech was very defective. During the last few years he has had several “fits.” One of his sisters died in “convulsions” at four months. The medical report shows that his present physical condition is fair. The general home conditions are poor, and the boy was charged with petty stealing in company. He

has truanted a good deal from the denominational school at which he is enrolled. His scholastic attainments are very poor and his I.Q. 66—a suitable case for special class treatment.

The notes selected from these two case histories are designed to illustrate the operation of different factors. Of the six cases, five might be regarded as fairly high grade feeble-minded, who would benefit considerably from special class treatment, providing the physical condition was improved in some cases and the home conditions in others. It would be unscientific to generalise on these cases, but they indicate a trend, *i.e.*, towards the number of cases of feeble-mindedness among delinquent boys being somewhere in the region of 3%.

2. In the 31 cases of backwardness, scholastic work as revealed by school reports tended to be very poor. In most of these cases there was evidence of considerable truancy, lack of home supervision and of general opportunity to attend school regularly, poor physical condition and marked physical defect, and several other factors the combined operation of which could hardly be expected to give rise to results other than those obtained. Again let us select two cases for brief consideration.

CASE 141.—A boy, aged 12 years 3 months, charged with stealing money from a smaller boy. He attends a denominational school and was truanting at the time of the offence. The father is an invalid pensioner and the mother is engaged in laundry work. Both parents are of good character, but there is evidence of lack of supervision in the home through the father being an invalid and the mother being away at work a good deal. On the other hand, the home is adequately furnished and well ordered. The boy has missed a good deal of schooling through various illnesses. The medical report shows that he has very defective vision and bronchial catarrh. His I.Q. is 70. A very suitable case for special class treatment.

CASE 111.—A boy, aged 10 years 11 months, charged with stealing a large quantity of lead in company with seven other boys. All were truanting at the time of the offence. The father is deceased. The mother is of good character and the home is in fair condition. There are two brothers, one 18 years, who practically supports the home, and one 9 years involved in this case. There is evidence of lack of home supervision and for some time the police have been interested in the manner in which this boy's after school hours are spent. The medical report shows that the boy has very defective hearing and nasal obstruction causing nasal catarrh. His I.Q. is 80.

Again these notes are selected to illustrate the operation of different factors. All these boys would benefit very materially from special class treatment.

3. Neglecting the great mass of average boys, let us remember that 13 were above average ability, *i.e.*, had Intelligence Quotients above 110, and of these, two had Quotients above 130. Let us consider these two cases briefly.

CASE 108.—A boy, aged 11 years, charged with breaking and entering a shop and dwelling and stealing groceries in company. They were not truanting at the time of the offence. (As a matter of fact the offence occurred on a Sunday when the owner was away from home.

The boys entertained themselves by playing the pianola and consuming considerable quantities of plum pudding and condensed milk. The groceries stolen were hidden for future consumption.) The boy's father is an invalid pensioner of good character. The mother is also of good character. There are nine other members of the family, five of whom contribute to the upkeep of the home. The home is adequately furnished, well ordered and in a good neighbourhood. The boy has ample facility for recreation. His attendance at school is very regular and his conduct at school good. He indulges in plenty of sport, is in bed at 8 o'clock each evening. He goes to the pictures each Saturday afternoon, and reads widely. The police report shows that his parents exercise due control and that the family is respected in the community. He is free from physical defect, and his I.Q. is 132.

CASE 103.—A boy, aged 8 years 6 months, who in company with a boy aged 13 years (not examined) had maliciously damaged untenanted houses and stolen a quantity of carpenters' tools. The extent of the damage was about £50, and included the smashing of electric light and gas fittings and the disfiguring of walls with a tomahawk and various mixtures of paint. When charged with the offence this boy boasted of having done the same thing on former occasions and of having escaped detection. His father is deceased and his step-father has deserted his mother. The home is well furnished and in excellent order. The locality is good. Although not a regular truant the boy was truanting at the time of this offence. His conduct at school is reported as good. He is free from physical defect and his I.Q. is 135.

Again these notes are selected to illustrate the operation of different factors. It must be patent that such cases as these constitute quite a different problem in treatment.

At this stage in the research it is impossible to give any definite conclusions about the various influences of different environments. An examination of the *actual locality of residence* of these 161 cases would seem to indicate that delinquents are drawn from all types of locality. If there be a balance in favour of the so-called "slum areas" it might be accounted for partly on the score of greater police vigilance.

Here for example is a boy aged 10 years 9 months, from Waterloo, charged with being a neglected child and living under such conditions as would indicate that he is "lapsing into a career of vice and crime." His mother is an invalid and in a very poor state of health. She is reported to be of good character, but is unable to care for this boy. His father's movements are unknown and this boy is living with an aunt. He suffers from marked physical defects. His I.Q. is 76. Occasionally he attends a denominational school. The entire circumstances are such that we are not surprised that at this early age he should be guilty of a sex offence on a small boy of four years.

On the other hand, here is a boy, aged 14 years 9 months, from Manly, charged with stealing money from cubicles in surf sheds. His father occupies a good position, both father and mother being reported as "of excellent character." The home is in excellent order and the general surroundings most

desirable. The boy attends a High School, reports from which show that his attendance, progress and conduct are excellent. The reports show that the parents "exercise due control" over the boy. He is an athlete and spends most of his spare time swimming and fishing. He is well dressed, well mannered and most truthful in his explanation of the theft. There is every evidence that this boy lives in the best of circumstances.

If the word environment be interpreted as *actual home conditions*, there is definite evidence to show that a poor environment acts detrimentally to the child, nor is this otherwise than might be expected. I have already quoted cases which illustrate this point. In some cases the families are large and the general economic conditions poor. The father may have no fixed employment and very often be unemployed. In some cases the character of either or both parents is questionable. Drink and gambling are vices frequently manifest in lurid brilliance. Often the parents are of different religious persuasions and the children of no persuasion. Sometimes the parents are separated, and so one could continue enumerating factors which contribute to a bad home environment. There tends to be a lack of parental interest in the children. Little importance is attached to the regularity of their attendance at school. During leisure hours there is little or no parental control. The children are often allowed to go to picture and vaudeville shows frequently during the week to the detriment of their health and school work. In many cases there is no evidence of useful hobbies or interests in the home. While a general complex of conditions, such as these tends to operate in quite a large number of cases, there are shining exceptions.

Brief consideration may now be given of the two major offences committed by boys of school age, *i.e.*, truancy and stealing. I limit the discussion to boys of school age, because the time at my disposal will not allow of an analysis of the complex range of offences committed by boys who have left school. Truancy and stealing are often closely associated. Sometimes a plan to steal prompts truancy, but more often stealing is incidental to truancy.

(a) *Truancy*.—In his "Apology for Idlers" Stevenson attempts to vindicate the truant against all charges of wasting time. "If a lad does not learn in the streets," he says, "it is because he has no faculty for learning." We may agree with this contention up to a certain point, but Stevenson's idea of a truant is very different from ours. "The truant," according to Stevenson, "may go out by gardened suburbs into the country. He may pitch on some tuft of lilacs over a burn, and smoke innumerable pipes to the tune of water on

the stones. A bird will sing in the thicket and thus he may fall into a vein of kindly thought and see things in a new perspective." Our truant of course may do these things, but usually he is not so contemplative or ultra-respectable. He usually truants in company and seems bent on getting into every conceivable kind of mischief. When boys truant in company there is usually a preconceived plan. In most cases it is possible to detect a leader. When a boy truants alone the matter is usually more serious. His truancy may be due to excessive punishment, dislike of the teacher, or to an unfortunate misunderstanding between teacher and boy. It may be due to lack of interest in school work, which in turn may be due to the nature of the teaching, to being wrongly classified, to poor scholastic or general ability, or to physical defect. It may be due to lack of home supervision.

Truancing is very often a prelude to sleeping out in parks or sheds away from home, during which time the stealing of foodstuffs from shops or markets is a common offence. Sometimes truants undertake casual employment, and sometimes they travel to the country districts, as most of them say, "to have a look round." Usually truants of this type are very intelligent, have an interesting stock of information and have displayed considerable ingenuity in the art of living.

Occasionally one meets the unfortunate truant who inhabits back lanes and alleys. Usually he is a "sneak-thief," lies with marked ability and constitutes a very difficult problem in treatment. More often than not he is soaked in depraved sex knowledge, and while at that early age he may not commit sex offences, is the type of delinquent who a few years later will do so.

Let us consider two random cases of truancy giving rise to stealing.

(a) Two boys, aged 15 years and 14 years 8 months, attending a High School, lapsed into truancy. They lived in the same suburb a good way from the city and had to travel by rail to the same school. On the particular day in question they truanted and stole a number of books and bottles of ink from one of the big city stores. The books were mostly exercise and autograph books.

Both came from good homes. The parents are industrious, of good character and reported to exercise due control over the boys. Both have numerous hobbies, ranging from tending to fernhouses to making wireless sets. Both want to be electrical engineers. They seldom frequent picture shows, and both indulge in plenty of sport. So far as could be ascertained there was no particular motive for the theft; both liked school and ordinarily attended regularly.

(b) Four boys, aged 11 years, 11 years, 8 years and 6 years, attending the same school truanted. One of the boys, aged 11 years, was apparently the ringleader. After wandering about rather aimlessly on the day in question, they entered a yard and stole nine fowls and four ducks, which they took away to a neighbouring canal and killed. The ringleader showed no emotional response, but merely said that

they were "having fun." This boy's parents are of good character; the home is well ordered, adequately furnished and in a good locality. According to the report, this boy is "well controlled at home," has plenty of healthy occupations for his leisure hours, and attends Church and Sunday School regularly. He is free from physical defect. His I.Q. is 110.

Whatever be the actual causes of truancy it must be regarded as a very serious matter. It tends towards the creation of an indifferent outlook, and frequently leads to stealing and other offences.

(b) *Stealing*.—From the foregoing cases it will be noticed that the objects of theft are many and varied. The following list is fairly representative: Money, groceries, fruit and vegetables, lead and iron, bicycles, jewellery, sweets, books, tobacco, birds and animals. There are records of boys stealing fittings from fire alarm boxes and telephone bureaux.

Usually there is a definite motive for the theft, and very often younger boys are simply the agents of older boys. Sometimes economic conditions lead definitely to theft; sometimes some specific hobby will so engross a boy as to lead him to steal objects that will further his hobby.

A word or two may be said about employment in the case of delinquents who have left school. It is interesting and important to notice that these boys tend to change their occupation very frequently. Usually the occupation chosen is of that general type known as "dead-end" occupations. The highest possible wages are sought, usually of course under economic pressure in the home. Little or no consideration is given to ultimate ends. It is quite exceptional to find among delinquents, boys who are apprenticed to a trade. Herein lies a very profound problem from the social and economic points of view.

There is little need to stress the seriousness of the problem of delinquency, nor to urge that every facility be given for carrying out such research as will throw light on the causal factors and on possibilities of treatment. Delinquency is usually not due to the operation of any single cause, but to the operation of a number of causes, economic, social, moral, educational, physical and psychological.

It is now a psychological truism that instincts and innate tendencies are the essential springs of action. They supply the motive force, and constitute the groundwork on which character is built. If they are under the control of will and are guided to conform with the generally accepted standards of social and individual life, harmony results, and the essence of harmony is happiness. If, on the other hand, they escape the control of the individual, they will tend to manifest themselves in antisocial conduct, and herein lies their significance

from the point of view of delinquency. Instincts must be so moulded during the early impressionable years that right habits of conduct will be formed. Most cases of delinquency can be traced to aberrations of the various instincts and thus the problem centres round correct teaching in the school and at home.

NOTES BY THE WAY.

IX.

THE BOOK OF TEA.

By Okakura-Kakuzo.

(New York: Duffield & Co., 1921.)

Page 26.—Lichihlai, a Sung poet, has sadly remarked that there were three most deplorable things in the world: the spoiling of fine youths through false education, the degradation of fine paintings by vulgar admiration, and the utter waste of fine tea through incompetent manipulation.

Page 48.—Translation is always a treason, and as a Ming author observes, can at its best be only the reverse side of a brocade—all the threads are there, but not the subtlety of colour or design.

Page 58.—Chinese historians have always spoken of Taoism as the "art of being in the world," for it deals with the present—ourselves. It is in us that God meets Nature, and yesterday parts from to-morrow. The present is the moving Infinity, the legitimate sphere of the Relative. Relativity seeks Adjustment; Adjustment is Art. The art of life lies in a constant readjustment to our surroundings. Taoism accepts the mundane as it is and, unlike the Confucians and the Buddhists, tries to find beauty in our world of woe and worry. The Sung allegory of the Three Vinegar Tasters explains admirably the trend of the three doctrines. Sakyamuni, Confucius, and Laotse once stood before a jar of vinegar—the emblem of life—and each dipped in his finger to taste the brew. The matter-of-fact Confucius found it sour, the Buddha called it bitter, and Laotse pronounced it sweet.

Page 66.—One day Soshi (Chauntse), the Taoist, was walking on the bank of a river with a friend. "How delightfully the fishes are enjoying themselves in the water," exclaimed Soshi. His friend spake to him thus: "You are not a fish; how do you know that the fishes are enjoying themselves?" "You are not myself," returned Soshi; "how do you know that I do not know that the fishes are enjoying themselves?"

DO LINGUISTIC GROUP TESTS OF INTELLIGENCE, NON-LINGUISTIC GROUP TESTS OF INTELLIGENCE AND SCHOLASTIC TESTS MEASURE THE SAME THING?

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II.

SECTION 3.—FUTHER SEARCH FOR GROUP FACTORS AND “G” BY TREATMENT OF RESULTS OF COMPLETE SERIES OF TESTS GIVEN TO GROUP B.

Special Attention to Scholastic Tests.

THE main object of the testing of the Group B subjects was to provide material for a search for group factors common to two or more scholastic tests. We may obtain, however, further evidence of the presence of a factor common to “intelligence” and scholastic tests, *i.e.*, *g*, and we may discover a relationship between one or both of the “intelligence” tests on the one hand and one or more scholastic tests on the other.

Suitability of the Tests.

The suitability of the tests for the children tested is shown by the figures in Table IV.

TABLE IV.
*Certain Measures Showing the Distribution of Scores in the Tests
Used on Group B.
(N. 61.)*

Test	No. of Examples	Range	Mean	Median	Standard Deviation	Skewness
Linguistic ..	150	70-137	115	116	12.5	-.24
Picture ..	150	55-140	96.5	97.3	15.1	-.16
Spelling ..	80	33-77	58.1	60	11.2	-.51
Grammar ..	50	23-41	33.9	34.5	4.4	-.41
Geography ..	40	8-37	20.5	20.8	6.0	-.15
Arith. Prob. ..	40	13-36	24.2	24.4	5.7	-.10
Arith. S.O. ..	Speed Test	23-60	42.3	43	8.5	-.25

The measures given in Table IV show that each of the tests is measuring something, for in each case the distribution of the testees approximates to the normal distribution. The degrees of asymmetry of the distributions are indicated by the figures given for skewness. These figures have been obtained from Pearson's formula:

$$\text{Skewness} = \frac{\text{Mean} - \text{mode}^1}{\text{Standard deviation}}$$

$$= \frac{3(\text{mean} - \text{median})^2}{\text{Standard deviation}}$$

It is evident that any value for skewness other than zero indicates that the distribution does not correspond exactly to the normal distribution, and Yule tells us that, in moderately skewed distributions, the value does not exceed unity. The values given in Table IV show that all the distributions concerned are slightly skewed towards their upper limits, but they are sufficiently low for us to regard the distributions as approximating to the normal distribution.

Correlation Between Tests.

Having demonstrated that each of the tests measures something, we may now look for any relationship which may exist between any two or more tests. The coefficients of correlation between the various tests are shown in Table V.

TABLE V.

Intercorrelations of Complete Tests, Complete Series Given to Group B, and Intellectual Saturations of Tests.
(N. 61.)

	Ling.	Pict.	Spell.	Gram.	Geog.	Arith. Probs.	Arith. S.O.	Intell. Satn.
Ling.	—	.36	.49	.40	.17	.34	.30	.69
Pict. .. ..	.36	—	.20	.25	.37	.16	-.07	.35
Spell. .. ..	.49	.20	—	.36	-.21	.46	.50	.55
Gram. .. ..	.40	.25	.36	—	.23	.43	.41	.70
Geog. .. ..	.17	.37	-.21	.23	—	.25	-.01	.18
Arith. Probs. .	.34	.16	.46	.43	.25	—	.33	.65
Arith. S.O. ..	.30	-.07	.50	.41	-.01	.33	—	.42

(The Probable Errors are shown in Table VI).

The first indication of possible group factors is that given by peculiarly high coefficients. It will be noticed that the coefficients for the following pairs of tests are higher than the correlations of either or both of the component tests with other tests would lead us to expect: Linguistic-spelling, picture-linguistic, picture-geography, arithmetic s.o.-spelling.

Use of Tetrad Difference Criterion.

The next step in the search for group factors was to calculate the tetrad differences for all the tetrads in Table V. The distribution of the 105 tetrad differences in the table is shown in the frequency column diagram given below (Figure I), together with the normal curve drawn to the same standard deviation as the frequency columns.

¹ Udny Yule, *op. cit.*, p. 150.

² Udny Yule, *op. cit.*, p. 181.

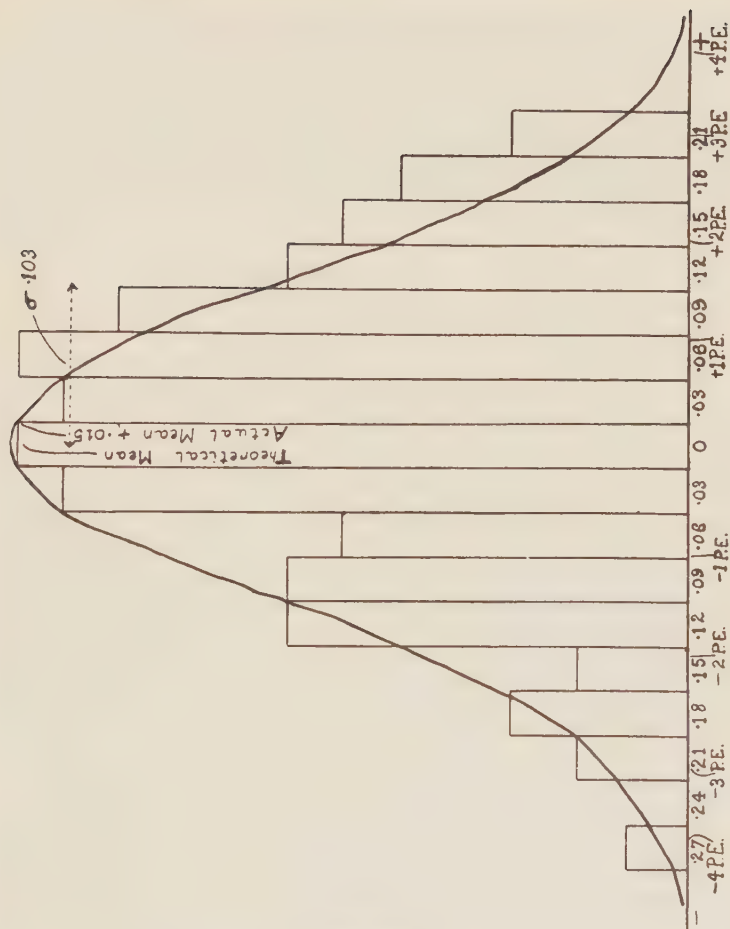


FIGURE I.

The reader will notice that the actual mean of the tetrad differences ($.0145$) is to the right of the theoretical mean for a series of tetrad differences (zero). If this shifting of the mean were appreciable, we should see in it cause to suspect the presence of group factors. The probable error of the mean has been obtained by the formula

$$\text{P.E.}_m = .67449 \frac{\Sigma}{N}$$

In this case, the probable error of the mean is approximately $.007$. Since the actual mean falls within 3 P.E. of the

theoretical mean, the shifting of the mean cannot be regarded as significant.

There is a close conformity between the actual distribution of the tetrad differences, shown by the column diagram, and the ideal distribution, shown by the normal curve. The standard errors of sampling for the larger peaked columns have been obtained by Yule's formula,¹

$$\Sigma_s = \sqrt{\frac{f(N-f)}{N}}$$

where f = expected frequency,

N = the number of cases.

In the case of the largest peak, that at +.18, the facts are:

Expected Frequency 2.5 (approx.)

Standard Error of Sampling . . . 1.6

Actual Frequency 5

Since the actual frequency is within the expected frequency plus three times the standard error of sampling, we may regard the peaking at +.18 as insignificant in itself.

The application of this formula to the other peaked frequencies in Figure I and to the more appreciable peakings which emerge on the negative side of the diagram when the normal curve is constructed on the actual mean instead of on the theoretical mean does not reveal a case where the peaking may be regarded as significant. Therefore, from this general survey, we obtain no evidence of the presence of group factors.

A general survey of this kind is, however, somewhat misleading, for it is possible that the consistent peaking beyond + 1 P.E. is caused by the influence of a few tests. Consequently, the very consistency of the peaking may be an indication of the presence of group factors. Further light will be thrown on this matter by a consideration of the actual tetrad differences which produce these peaked columns.

The necessity for an individual consideration of these tetrad differences is rendered more urgent by the fact that the probable errors of the individual differences, when calculated by Spearman's formula are, in every case, about .03.² Therefore, had we considered each of the tetrads separately, as we did when dealing with Table I (Section 2), the presence of a group factor would have been suspected wherever the tetrad difference exceeds three times .03. As we are also employing other methods to detect the presence of possible group factors in these tests, and as the more appreciable peaks are beyond

¹ Rugg, "Statistical Methods Applied to Education," p. 213.

² For the formula see article in the July, 1926, number of the *Australasian Journal of Psychology and Philosophy*.

2 P.E. of the distribution, we shall confine our special inquiry to the differences beyond plus or minus .135.¹

The table showing the twenty-two big tetrad differences and their causes is too long for publication here, but an analysis shows that only six of the twenty-one coefficients in Table V figure as high correlations producing big differences. The pairs of tests giving these high correlations and the number of times each pair contributes to big differences are given here:

Picture-geography	.. ..	9 times
Arithmetic s.o.-spelling	.. ..	7 times
Linguistic-spelling	.. ..	4 times
Linguistic-picture	.. ..	3 times
Spelling-arithmetic problems		3 times
Arithmetic s.o.-grammar	.. ..	3 times

As each coefficient in Table V is present in twenty tetrads only, the above analysis strengthens our suspicion of the presence of a group factor for picture-geography and another for arithmetic s.o.-spelling. The evidence regarding the existence of a significant group factor for each of the other pairs just mentioned is not so strong, but there is little doubt that, in each case, there is a fairly high positive correlation between specific factors. The use of the tetrad difference criterion has given support to the opinion which we formed from an inspection of the coefficients, but two more pairs of tests are added to the list then given.

Partial Correlation.

The partial correlations have been worked to the first approximation by the method described in Section 2. The coefficients are given in Table VI with certain necessary information.

It will be remembered that we are regarding a positive correlation for specific factors as giving distinct evidence of the presence of a group factor when the value for $r_{ab} - r_{ag} \cdot r_{bg}$ is in excess of three times the probable error of the coefficient of total correlation for the pair of tests concerned. Using this criterion, we find that our suspicion of the presence of group factors for picture-geography and spelling-arithmetic s.o. is well founded. So far as the last-mentioned pair is concerned, the present finding is in agreement with our earlier decision given in Section 2 and based on other results.

Since in all other cases positive values for $r_{ab} - r_{ag} \cdot r_{bg}$ are much less than 3 P.E., we must conclude that there is no

¹ Some investigators take five times the probable error of a tetrad difference as the criterion, i.e., 0.15 in this case, e.g. C. M. Davey, article cited.

TABLE VI.

*Partial Correlations for Complete Series of Tests Used on Group B.
(N. 61.)*

Tests.	$r_{s\cdot s}$	$r_{ab} - r_{ag} \cdot r_{bg}$	P.E.
Linguistic-Picture ..	+ .17	+ .1185	.075
Linguistic-Spelling ..	+ .18	+ .1105	.065
Linguistic-Grammar ..	-.16	-.0830	.072
Linguistic-Geography ..	+ .08	+ .0458	.084
Linguistic-Arith. Prob.	-.20	-.1085	.076
Linguistic-Arith. S.O. ..	+ .08	+ .0502	.078
Picture-Spelling ..	+ .01	+ .0075	.082
Picture-Grammar ..	+ .01	+ .0050	.081
Picture-Geography ..	+ .44	+ .3070	.075
Picture-Arith. Prob. ..	-.01	-.0675	.084
Picture-Arith. S. O. ..	-.25	-.2170	.086
Spelling-Grammar ..	-.00	-.0250	.075
Spelling-Geography ..	-.38	-.3090	.082
Spelling-Arith. Prob. ..	+ .16	+ .1025	.068
Spelling-Arith. S.O. ..	+ .36	+ .2690	.065
Grammar-Geography ..	+ .15	+ .1040	.081
Grammar-Arith. Prob. ..	-.00	-.0250	.070
Grammar-Arith. S.O. ..	+ .18	+ .1160	.072
Geography-Arith. Prob. ..	+ .16	+ .1170	.081
Geography-Arith. S.O. ..	-.10	-.0856	.086
Arith. Prob.-Arith. S.O.	+ .08	+ .0570	.076

evidence of the presence of significant group factors for any of our other suspect pairs. It is to be noticed that the group factor for linguistic-picture, the presence of which was demonstrated in Section 2, is not shown as significant in Table VI. The reduction of the value of $r_{ab} - r_{ag} \cdot r_{bg}$ for this pair of tests is due partly to the increased size and the new constitution of the series of tests and partly to the age of the Group B subjects. There is no doubt that the small group factor for these two tests is stronger at age 10-12 than it is at age 13-14.

Explanation of Group Factors Proved to be Present.

Picture-Geography.—The group factor for these two tests was unexpected and is difficult to explain. The geography test is frankly a test of information, but success in the picture test does not depend greatly on previously acquired information. We are prompted, therefore, to seek in another direction for the group factor, and we seem to find it in the test material of the picture test. There seems little doubt that success in dealing with sense material, including pictures, depends less on *g* and more on *s* as children grow older. In teaching geography in elementary schools, teachers make much use of pictures, maps and the child's power of forming visual images. Native and acquired preferences for pictorial presentation possibly determine the agreement between the scores in the geography and picture tests, and these preferences are probably the group factor which links the tests together. We

should not expect to find such a big group factor for these tests in the case of younger children.

Spelling-Arithmetic, Simple Operations.

The explanation of this group factor is that success in both tests depends to some extent on a conative factor which has been in operation in the learning of both spelling and the "tables" on which success in the arithmetical examples partly depends.

Facilitation is also a factor conducive to success in both of these tests. These two factors, which are anoegenetic in character,¹ together make a group factor which is to some extent an "effect of training" factor, where the training is due to the school or the home, or both. This factor might be called also an "effect of practice" factor, though this phrase stresses the part played by facilitation in determining success in the tests. There is no doubt that training is more effective in producing success in these two tests than in the grammar test and arithmetical problems, for the last-mentioned tests are richer in novel situations than are the two which we are discussing.

Linguistic-Picture.—The presence of this group factor for children of ages 10 to 12 was demonstrated in Section 2, but no consideration of the nature of the factor was made there. The small group factor is probably due to the fact that the children who happened to develop the best technique for dealing with the test examples on the first test given carried that technique over to the second test, for the same forms of tests, similarities *et cetera* were used in both types. Thus the child who attacked the picture opposites, similarities and analogies by educing correlates would have a better technique than the child who used the method of educing relations. Each child would carry over to the second test the technique adopted at first, with the result that the scores of the first child in the two tests would be as high as the child could make them with the amount of *g* at his disposal, while the scores of the second child would be lower than they would have been had the child adopted the better technique.² The correlation between the two tests would be increased by this group factor, but the correlation of either test with, say arithmetic, would not be affected by it. Though the adoption of the better technique is in itself an indication of intelligence, its signifi-

¹ Spearman, *op. cit.*, chapter 9.

² This explanation of a group factor is used by Dr. C. S. Slocombe in another connection in an unpublished thesis lent to the writer by Dr. C. R. McRae.

cance as an indication is exaggerated by the number of the examples in the test, which makes the advantage gained greater than the extra intelligence would warrant.

A similar group factor is formed when some children fail to understand what to do in one or more tests. In the case of young children in particular, there is sometimes a failure to grasp what has to be done in the analogies test. This failure on the part of some children to understand how to do one or more tests caused the scores of these children in the two "intelligence" tests to be unduly low, and the size of the group factor was increased by the fact that the same forms of test were used in both series. The reduced size of the group factor in the case of the Group B subjects is partly due to the fact that this particular factor was less effective with these older children.

The group factors which are common to the two "intelligence" tests are clearly not due to the fact that these tests measure a thing different from that which the scholastic tests measure. They are not factors which are inherent in "intelligence" tests, but they are factors which, theoretically at least, are removable.

Further Search for Distinct Group Factors for "Intelligence" Tests and Scholastic Tests.

To complete the search for a group factor common to "intelligence" tests and another common to scholastic tests, we have ascertained the coefficients of correlation for certain tests and have applied the tetrad difference criterion to the coefficients. The intercorrelations of the tests are shown in Table VII.

TABLE VII.

Intercorrelations of Linguistic and Scholastic Tests, Group B.
(N. 61.)

	Sim.	Anal.	Compn.	Spell.	Gram.	Arith. Probs.
Sim.	—	.33	.29	.56	.50	.19
Anal. .. .. .	.33	—	.28	.17	.35	.28
Compn. .. ..	.29	.28	—	.30	.37	.24
Spell. .. .. .	.56	.17	.30	—	.36	.46
Gram. .. .. .	.50	.35	.37	.36	—	.43
Arith. Probs. ..	.19	.28	.24	.46	.43	—

There are eighteen tetrads which show intelligence-intelligence and scholastic-scholastic at the end of one diagonal and intelligence-scholastic in the other corners. No tetrad difference exceeds 4 P.E., and only one exceeds 3 P.E.; there are six negative differences; the mean of the differences is + 0.16 and the probable error of the mean .0094. The evidence just summarized gives conclusive proof of the presence of *g* and *s* alone in each of the tests in the series.

The Presence of "g".

The correlations of the picture and geography tests respectively with other tests are so low that, except in two cases where there is some evidence of the presence of group factors, their values when reduced to the extent of 3 P.E. reach zero or become negative. These two tests share the three negative correlations which appear in Table V, though none of these coefficients is less than zero to the extent of 3 P.E. Nevertheless, the general tendency of the correlations of each of these tests with other tests is towards a small positive value, and we are justified in concluding that to some extent they measure the same thing as do the other tests in the series. That they do so is indicated also by their coefficients of intellectual saturation. The smallness of these saturation coefficients shows, however, that these tests are of little value as measures of this common thing.

There is no other case where $r - 3$ P.E. is as low as zero, and since spelling and arithmetic, simple operations, contain the only significant group factor present, it follows that the correlations between all the other pairs are due to the influence of a common factor. The correlation between spelling and arithmetic, simple operations, is produced partly by the common thing and partly by the group factor. The presence of this common factor for linguistic and scholastic tests is brought out more strongly by the results of the treatment given to Table VII.

The relative values of the various tests in the series as measures of this common thing are indicated by their intellectual saturations. Now, even if we allow, for the present, that the linguistic test is closely related to schooling because it demands a knowledge of the meanings of words and this knowledge is acquired at school, and we cannot agree that it is such a direct test of the results of schooling as is any one of the scholastic tests. Therefore we can conclude that, if the thing measured by these tests in common be effect of schooling, the linguistic test should be one of the worst tests in the series. As it is actually one of the best, we are forced to the conclusion that the common thing is something other than effect of schooling. This thing we are now prepared to call *g*, so far as the scope of this inquiry allows us to do so. We have therefore arrived at the same conclusion regarding the nature of this factor as we reached at the end of Section 2.

Value of Scholastic Tests as Measures of "g".

The high intellectual saturations of the grammar and arithmetic problems tests show that, for use on a class group,

tests of this nature are little inferior to an "intelligence" test as measured by g , and the same is true to a lesser extent of the spelling test. The value of the two best scholastic tests is directly due to the fact that they present to the testee novel situations and consequently call for the use of noëgenetic processes. The anoëgenetic process of reproduction is of less use to the testee in these tests than in ordinary school examinations in grammar and arithmetic.

However, it is safe to assume that the linguistic test, which has been shown to be equal to the best scholastic test as a measure of g in a homogeneous group, such as the grade group group used, would be the best measure for general use. It is also likely that the "intelligence" test used is more capable of improvement than is any one of the scholastic tests used. As was pointed out in Section 1, a standardized "intelligence" test was not employed and the test series was restricted to certain test forms. By the provision of a greater number of crucial examples and a wider variety of test forms, a more efficient test series could be produced.

*The Importance of Specific Factors.*¹

So far, we have devoted our attention to g , the factor common to all the tests and to the group factors. It is to be remembered, however, that there are also uncorrelated specific factors belonging to each test. Spearman's thesis is that these specific factors will cancel one another, and that their influence can be removed by careful construction of tests.

Since the highest coefficient obtained by us is .70 for linguistic-spelling, it is likely that uncorrelated specific factors were, in every case, more influential in determining success in a particular test than were common factors. Consequently, it is clear that, although our tests measure the same thing, they do not do so to the extent that the amount of success gained by a child in any one test can be used to predict, with much certainty, his success in another test.

So far as the linguistic and scholastic tests are concerned, the correlations between scores are but little improved if the scores in the scholastic tests be pooled. The coefficient between the linguistic test and the pooled scores for the five scholastic tests is .37, and the coefficient when the pooled scores of the three most effective scholastic tests are used is .41. In each case the pooling was done by bringing the distributions to a common standard deviation and by adding the scores after they had been altered to fit into the new distributions. Since the average value for r for linguistic-scholastic calculated from

¹ An important note on the interpretation of coefficients of correlation is given by P. H. Nygaard in the *Journal of Educational Psychology*, February, 1926, pp. 86-92.

Table V is .34 for the complete series of scholastic tests and .41 for the best three scholastic tests, it is clear that pooling the scores has had little effect on the coefficients.

It must be borne in mind that, with the exception of the geography test, our scholastic tests were decidedly good tests, and it is interesting to note that although our coefficients are lower than those given by Starch for children whose ages are not specified, they compare favourably with coefficients obtained by Thorndike and others.¹ It may be argued that the number of testees was small, but the fact remains that, even when three times the probable error is added to the highest coefficient obtained for two scholastic tests which are not related by a group factor, the value is but .67. Furthermore, a group of 61 children is above the size of the average school class, and the practical value of tests depends largely on what they will do with a school class. The importance of specific factors is so great that the ranking of pupils by an "intelligence" test has little value as a prediction of their ranks in individual or pooled scholastic tests.

SECTION 4.—SEARCH FOR GROUP FACTORS COMMON TO PICTURE AND LINGUISTIC TESTS RESPECTIVELY.

Nature of the Inquiry.

In this section the scores obtained by the Group A children in the various picture and linguistic tests are treated by the mathematical methods which have been used already. The purpose of this inquiry is to ascertain whether or not the picture tests on the one hand and the linguistic tests on the other contain group factors.

Correlations.

TABLE VIII.

Intercorrelations of Distinct Tests, Picture and Linguistic, Group B.² (N. 142.)

	P.S.	P.O.	P.Cl.	P.A.	P.Cn.	L.S.	L.O.	L.Cl.	L.A.	L.Cn.
P.S. ..	—	.26	.40	.40	.33	.40	.31	.35	.31	.28
P.O. ..	.26	—	.26	.31	.22	.38	.39	.29	.31	.24
P.Cl. ..	.40	.26	—	.41	.38	.32	.31	.33	.35	.32
P.A. ..	.40	.31	.41	—	.40	.48	.51	.38	.56	.40
P.Cn. ..	.33	.22	.38	.40	—	.30	.32	.32	.31	.39
L.S. ..	.40	.38	.32	.48	.30	—	.56	.56	.50	.45
L.O. ..	.31	.39	.31	.51	.32	.56	—	.54	.52	.48
L.Cl. ..	.35	.29	.33	.38	.32	.56	.54	—	.40	.42
L.A. ..	.31	.31	.35	.56	.31	.50	.52	.40	—	.50
L.Cn. ..	.28	.24	.32	.40	.39	.45	.48	.42	.50	—
Intell. Satn.	.54	.46	.54	.70	.52	.72	.72	.65	.68	.62

(The probable errors lie between .039 and .053.)

¹ Starch, *Educational Psychology*, pp. 55-56.

² The tests are represented by their initial letters, e.g. picture similarities by P.S. and linguistic classification by L.Cl.

It is interesting to note the close correspondence between our coefficients and those obtained by Dr. Davey. This is shown in Table IX.

TABLE IX.

Average Correlations—Dr. Davey and Present Inquiry.

Tests.	Dr. Davey. ¹		Ourselves.	
	r.	P.E.	r.	P.E.
Whole Table .. ..	.34	.039	.38	.047
Picture .. ..	.31	.040	.34	.048
Linguistic .. ..	.40	.037	.49	.043
Picture-Linguistic ..	.32	.040	.35	.048

Our average correlations indicate the presence of group factors for, if group factors were not present, the average correlation for picture-linguistic would be greater than .35.

Use of Tetrad Difference Criterion.

In Table VIII there are 200 tetrads showing picture-picture and linguistic-linguistic at the ends of one diagonal. The distribution of the tetrad differences is shown in Figure II, together with the curve of normal distribution drawn to the standard deviation of the column diagram.

The column diagram is almost symmetrical, the sole significant peaking being at .11. The shaded part of the column indicates the extent to which the actual frequency at .11 exceeds the expected frequency plus three times the standard error of sampling.

Individual consideration of each of the fourteen differences greater than .105 shows that two pairs of picture tests and three pairs of linguistic tests are mainly responsible for the big tetrad differences. The pairs concerned and the number of big differences to which each contributes are:

Picture classification-picture similarities ..	6
Picture classification-picture completion ..	5
Linguistic similarities-linguistic classification	5
Linguistic similarities-linguistic opposites ..	3
Linguistic opposites-linguistic classification ..	3

Each of the big tetrad differences lies between three and five times its own probable error. Therefore, there is some evidence that each of the pairs listed above contains a small group factor.

In the case of the picture classification and picture completion tests, the probable cause of the group factor is the intrusion of the reproductive process in the completion test

¹ From page 36 of article quoted.

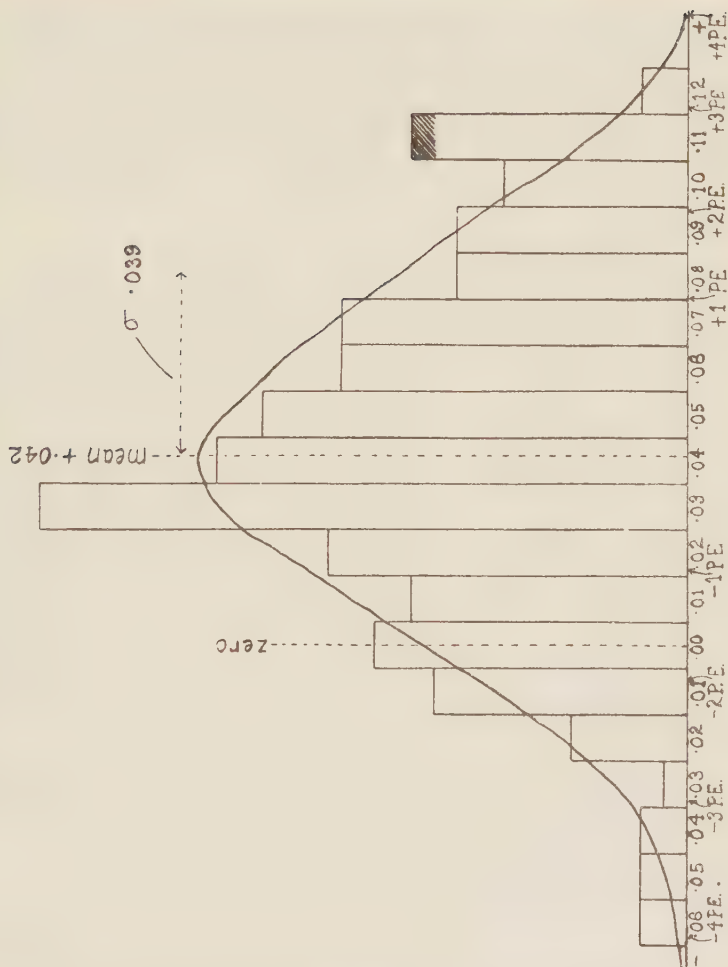


FIGURE II.

Distribution of 200 Tetrad Differences—Picture-Linguistic.

and in the second part of the classification test. In the first case, there is involved the reproduction of correlates which have been educed previously, while in the second case, the reproduction of relations and correlates previously educed is demanded.

In each of the other cases, the group factor is due to the fact that the method adopted by a testee in solving the first test attacked is used in solving the other tests. Each of the tests can be solved either by the education of relationships or

the education of correlates and the tests are so similar in form that many of the testees transfer to later tests the method adopted for the first test presented.

None of these group factors is inherent in the test material. Each factor is common to some linguistic tests or some picture tests only, not to all tests of one type, and, theoretically at least, each factor can be removed or rendered insignificant.

The Deviation of the Mean from Zero.

The symmetrical shape of the column diagram in Figure II merely shows that success in each of the tests in any one series is produced mainly by the influence of factors common to all the tests in that series. The common influence may be g alone, or it may be g plus a group factor, in one case or in both cases.

The actual mean of the differences graphed in Table II is $+ \cdot 042$, and the probable error of the mean is $\cdot 0018$. Since the position of the actual mean on the base line of the graph is beyond a distance from zero equal to 3 P.E._m, we must conclude that there is a group factor operating in one series of tests or two separate group factors, one for each series. When the curve of normal distribution is drawn with its greatest ordinate erected at zero, the presence of this factor or these factors is shown clearly by the emergence of the heads of the frequency columns above the curve on the right-hand side of the theoretical mean.

Partial Correlations.

To show more plainly the presence of the group factor or the group factors and to obtain an indication of their size and identity, we have ascertained the partial correlations for the various pairs of tests. The most striking feature in our table of forty-five partial correlations is that in no case does the value for $r_{ab} - r_{ag} \cdot r_{bg}$ reach 3 P.E._r, and that in only four cases does it exceed 2 P.E._r. Consequently, no one partial correlation, in itself, gives evidence of the presence of a group factor, and any group factors which may be shown by other methods to be present must be small.

Although all the coefficients are small, sixteen of the twenty coefficients between tests of the same type are positive, while nineteen of twenty-five partial correlations between tests of different types have negative values. Five of the six positive values for tests of different types are distinctly due to the form of the tests, for every two tests of the same form, except the two classification tests, show positive values, and the fifth pair is picture opposites-linguistic similarities. The other value may be disregarded for in that particular case

$r_{ab} - r_{ag}$. r_{bg} is but one-seventh of P.E._r. The explanation already given of group factors in tests of similar form and the same type holds for tests of the same form but different types. In the latter case, the group factor due to form will act in opposition to a group factor due to presentation material, while in the former case any group factors for form and type will work together.

Group Factors Due to Presentation Material.

After allowing for the influence of group factors due to things other than presentation material, we have still, in the shifting of the mean in Figure II and in the general tendency of our partial correlations, evidence of the presence of group factors due to presentation material.

It will be remembered that our subjects were of both sexes. Dr. Davey gives some very striking evidence to show that boys do better than girls in picture tests, but that girls are superior to boys in linguistic tests. She supplies graphs which show that the median scores for her picture test are approximately 104 for boys and 76 for girls and that, for her linguistic test, the boys' median is 78 and the girls' 95. Dr. Davey proceeds to show how these big differences would produce a group factor due to sex.

The differences between Dr. Davey's medians are remarkable, and, if they are typical, they show a need for an immediate change in the methods of using "intelligence" tests. If the boys' median exceeds the girls' median by 28 points in the picture test and falls short of it by 17 points in the linguistic test, the practice of using a linguistic group test with one set of norms for boys and girls alike is entirely wrong, and one type of material is, or both types are, unsuitable for the testing of general intelligence.

In Table X we supply certain measures which give a good idea of the relative amounts of success obtained by boys and girls respectively in our picture and linguistic tests.

TABLE X.

Measures Relating to Scores of Seventy-eight Boys and Sixty Girls in Picture and Linguistic Tests.

Test.	Sex.	Range.	Mean.	P.E. _m	Standard Deviation.
Picture ..	Boys	67-117	88.3	.096	11.1
	Girls	49-114	83.3	.189	16.8
Linguistic .	Boys	42-118	86.7	.161	18.6
	Girls	35-127	87.0	.252	22.4

It will be noticed that when allowance is made for 3 P.E._m in each case, there is nothing to show clearly that the differences between the mean scores of boys and girls are attributable to anything other than chance. Our results certainly suggest that there may be a very small sex factor in the picture tests, but there is no evidence that this factor, if it does exist, is at all appreciable.

Dr. Davey has reason to suspect that an age factor has helped to reduce the correlations between her picture and linguistic tests. The correlations for picture-linguistic given in our Table III support this view so far as Dr. Davey's results are concerned, for the range of ages of her subjects is far greater than is the age range of our A Group. That an age factor is not the cause of the partial correlations which we are considering is shown, however, by the closeness in value of the coefficients for picture-linguistic for the upper and lower sections of the group with which we are dealing.

Since we cannot admit the presence of sex or age factors, we are forced to attribute the shifting of the mean to the right in Figure II to small group factors due entirely to presentation material. It is not clear whether there are two separate factors for linguistic and picture tests respectively or whether there is a group factor for one type only.

Presence of "g".

When the smallest coefficient in Table VIII is reduced by three times its own probable error, its value is still positive. Furthermore, the partial correlations are all small. Therefore, there is no doubt that all the tests are measuring the same thing. In Sections 2 and 3, this common factor has been shown to be *g* plus the small group factor for "intelligence" tests.

Importance of Specific Factors.

When the pooled scores in the picture tests are compared with the pooled scores in the linguistic tests, the coefficient is .66, which is much greater than .35, the average of the coefficients for individual picture and linguistic tests. Although it is partly due to the influence of group factors common to tests of the same form, this increase in the value of the coefficient through the pooling of scores is caused mainly by the enhanced importance of *g* and the reduced importance of the uncorrelated specific factors.

There is no doubt that each one of our tests could be greatly improved without the intrusion of new group factors. Consequently, the significance of the specific factors could be still further reduced. There is considerable support for Spearman's thesis that, theoretically, *g* can be brought to sole influence.

It is to be remembered that, when we stressed the importance of specific factors for scholastic tests in Section 3, we were basing our conclusions on the treatment of the scores of the Group B subjects. The importance of *g* as a factor for success in scholastic tests would certainly be greater in the case of the younger children. Nevertheless, there seems no doubt that, even with these younger children, a complete linguistic test would be a better measure of *g* than would a combination of scholastic tests, and it is not unlikely that a complete and well constructed picture test would also prove superior to such a combination as a measure of *g* in young children.

Relative Values of the Tests.

The intellectual saturations given in Table VIII show that the linguistic tests are, in the main, better measures of *g* than are the picture tests. An interesting exception is the picture analogies test. Its comparatively high intellectual saturation is due partly to the fact that it offers the constructor of tests a greater variety of relationships with which to work than does any other picture test.

The intellectual saturations have, of course, no general significance, but, although our picture tests are admittedly far from perfect, picture tests as a class do not seem to give the person who draws up tests as much scope as do linguistic tests.

SECTION 5.—SUMMARY OF CONCLUSIONS.

1. *Presence of a General Factor.*—Success in linguistic group tests of “intelligence,” in picture group tests of “intelligence” and in scholastic tests is produced partly by a factor common to all cognitive operations involved in the working of the tests.

2. *Influence of Group Factors.*—There is a small group factor common to “intelligence” tests of different types. This group factor is more influential in the case of children under the age of 12 years than in the case of older children. There is need for further inquiry into the possible presence of this factor when the tests in the two series used are of different forms.

There is no evidence of the presence of a group factor making for success in linguistic group tests and certain scholastic tests, but there is some evidence of the presence of a group factor common to the picture and geography tests. There is need for much further inquiry to determine whether this group factor is always present and, if it is always present, to throw further light on its cause. It is possible that the

matter is connected with the use of imagery in thinking, and it is suggested that Spearman's treatment of imagery is inadequate.

The only scholastic tests which were shown to be connected by the common possession of a group factor are the spelling and arithmetic simple operations tests. The direct effects of training can bring success in these tests to comparatively "unintelligent" children.

There are small group factors common to linguistic and picture tests respectively, and other small group factors common to tests of the same form or of similar forms.

3. *Comparative Values of the Tests.*—Taking into account the quality of each of the tests used as a test of its type, we conclude that the linguistic test is the best measure of g at all ages from 10 years to 14 years. The grammar and arithmetical problem tests compare well with the linguistic tests used for children from 12 years to 14 years. There is no evidence that greatly improved results are obtained by pooling the scores in scholastic tests.

Both "intelligence" tests give better results with children from 10 to 12 years old than they do with children between 12 and 14 years of age. The picture test, the arithmetic, simple operations, test and the geography test are of little value as measures of g for children above the age of 12 years.

No good purpose would be served by replacing linguistic tests by picture tests for the testing of children above the mental age of 10 years, but there is no reason why picture tests should not be used to measure g in younger children and in children who cannot use the language in which the linguistic tests are couched.

4. *The Importance of Specific Factors.*—Owing to the great importance of uncorrelated specific factors in "intelligence" tests, it is essential to use a large number of different forms of test in a test series. There is need to consider the advisability of using a long group test which could be given in sections at different sittings.

5. *The Value of Spearman's Principles.*—We found that those scholastic tests which proved to be the best measures of g were the tests which contained novel situations. The tests which depended largely on reproduction or facilitation for their solution proved poor measures of g . The picture tests, which were based on Spearman's noëgenetic principles, gave good results when they were used with children below the age of 12 years. The linguistic tests, also based on these principles, gave good results at all ages. We conclude that these principles form a sound basis for the construction of "intelligence" tests and that they are also of great use to

the person who wishes to make a critical evaluation of "intelligence" tests without submitting the tests to actual trial.¹

¹ The writer wishes to acknowledge the help given by Mr. L. G. Whitevale, Teachers' College, Melbourne, who drew the picture tests, and assistance rendered by head teachers and class teachers.

NOTES BY THE WAY.

X.

"Decadence in art is always caused by professionalism, which makes the technique of art too difficult, and so destroys the artist's energy and joy in his practice of it. Teachers of the arts are always inclined to insist on their difficulty and to set hard tasks to their pupils for the sake of their hardness; and often the pupil stays too long learning until he thinks that anything which is difficult to do must therefore be worth doing. This notion also overawes the general public so that they value what looks to them difficult; but in art that which seems difficult to us fails with us, we are aware of the difficulty, not of the art. The greater the work of art the easier it seems to us. We feel that we could have done it ourselves if only we had had the luck to hit upon that way of doing it; indeed, where our æsthetic experience of it is complete, we feel as if we were doing it ourselves; our minds jump with the artist's mind; we are for the moment the artist himself in his very act of creation. But we are always apt to undervalue this true and complete æsthetic experience, because it seems so easy and simple, and we mistake for it a painful sense of the artist's skill, of his professional accomplishment. So we demand of artists that they shall impress us with their accomplishment; we have not had our money's worth unless we feel that we could not possibly do ourselves what they have done." (A. Clutton-Brock: *Professionalism in Art (Essays on Art).*)

SOME PSYCHO-PHYSICAL TESTS ON DEAF, DUMB AND BLIND SUBJECTS.¹

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INTRODUCTION.

THE general aim was to compare certain simple psychological and physical measurements of deaf and dumb subjects with those of normal subjects. A number of tests were used, some taken from Whipple's "Manual of Mental and Physical Tests" (references are to the 1910 edition), others from other sources. For some tests, norms were available; for others, not; results of the latter are given, as well as of the former, in case the norms necessary for comparison become available in the future. Practical considerations forced the discarding of a number of tests originally selected for use.

METHOD IN GENERAL.

In the use of all the tests, the procedures laid down by authorities were followed as closely as possible. It will be apparent, however, that certain modifications had to be made to meet the circumstances of the case. For example, at first the experimenters thought that the authorised forms of instruction to the subjects could be followed to the letter by presenting them in writing; later, by means of the interpretation through a deaf pupil of noticeable brightness. It was found, however, that nothing conveyed the instructions so adequately and quickly to subjects of all ages and brightness, as gesture and pantomime of the performance. Such a necessary departure from rigid procedure was the more warranted in that the tests were simple psychophysical tests, not involving much independent thought by the subject.

The tests applied were arranged in a series calculated to prevent mutual interference in performance and fatigue. Tests involving delicate sensory discriminations were given early in the series; those involving minor bodily movements, later; a test involving mass movement, last of all. The apparatus used was arranged around the room occupied, in the order of use. Thus when one experimenter had advanced a few stages in the testing of one subject, the other was able to begin with another subject. Both subjects being deaf, it was only necessary to arrange that one should not be able to watch the other, to eliminate mutual distraction and interference.

TESTS AND PROCEDURES EMPLOYED.

Space does not permit a full report of the details of tests and procedure. Only indications can be given. The following data were obtained:

Body Height } Obtained from the records of the Institute.
Body Weight }

Strength of Grip. Measured by the Hand Dynamometer (see Whipple, p. 174). The best of three attempts with the preferred hand is shown.

¹ During the later part of 1924 and the earlier part of 1925, a survey of deaf and dumb subjects, by means of certain simple psychological and physical tests, was undertaken by the writers. The work was carried out under the direction of Dr. A. H. Martin, at the Institute for the Deaf, Dumb and Blind at Darlington. Special thanks are due to the Superintendent, Mr. H. Earlam, who allowed the pupils of the Institution to be used as subjects, and provided accommodation for apparatus.

- Brain Content.* Measured by the method of Berry and Porteus described in Porteus's "Studies in Mental Deviation," p. 31.
- Ability in Assembling Small Parts* (i.e., combined manu-motor accuracy and speed). Measured by "The Assembling Matches Test." The subject picks up matches, laid out in a pattern, puts them in a match box, and closes it. The time taken is the score. The test is described, with norms, in THE AUSTRALASIAN JOURNAL OF PSYCHOLOGY AND PHILOSOPHY, June, 1927.
- Ability to Discriminate Lifted Weights* (Whipple, p. 190). A standard of 80 gm., with a comparison series of weights of 81, 82 90, 92, 94, 96, 100, 110, 120 gm. was used.
- Æsthesiometric Limen.* Method described by Whipple, p. 209. The Jastrow Æsthesiometer was used.
- Span of Visual Attention.* Measured by the greatest number of round dots the subject could perceive in one-tenth second. The dots were arranged irregularly on cards bearing 1 to 10 dots, the cards being shown, in chance order, in a large Thornton-Pickard Shutter Tachistoscope.
- Sensori-Motor Control.* Measured by Whipple's "aiming test" (p. 115) modified by Muscio. The subject strikes at a succession of "bulls' eyes" printed on a target-sheet. The striking proceeds at constant speed, the score being determined in the conventional way. The deaf subjects were taught to strike in time with light taps on the disengaged shoulder.
- Colour Discrimination.* The test consisted in sorting a number of cards, bearing each a spot of colour, into receptacles, each marked by a strip of colour. The number of reds and greens mutually miss-sorted was recorded (certain subjects miss-sorting these colours were re-tested using the Edridge-Green Colour Test). Times were also taken. The test was devised by Dr. A. H. Martin.

AGE DISTRIBUTION OF SUBJECTS.

Ages were in all cases calculated to the nearest birthday. For economy of space, results in general have only been shown where there were more than three subjects per year of age; though subjects both older and younger than the age-range this involved were tested. It will be noted that in some tables there are not the same number of subjects shown as in others. A subject's score was sometimes omitted when he suffered some particular physical disability in regard to the particular test; in a few cases the omitted subject was not available owing to illness, etc. The body heights, weights and brain contents were determined at a later date than the other capacities; hence for these a new set of ages (giving a different age distribution) had to be calculated.

NORMS.

Investigation of this nature is at a disadvantage, particularly because of the small number of standardised psychological tests of any kind which exist. Australian norms for the Assembling Matches Test (now published) were obtained from the Psychology Department, University of Sydney. The Psychology Department of the Sydney Teachers' College was kind enough to supply Australian norms for Height, Weight, Strength of Grip, and Speed of Tapping. Brain content norms for the boys were taken from Porteus's "Studies in Mental Deviations," p. 38; and for girls, were calculated from the measurements given (on p. 43) in the same work. It should be noted that an adjustment was made in determining the Tapping norms, the Teachers' College investigators having used a 20 second period, while the present experiments used a 30 second period.

The performances given by Whipple (p. 192) for Weight Discrimination do not strictly apply to the present case; but they offer the closest comparison available.

NATURE OF RESULTS.

Only very tentative conclusions can be drawn from the results, which show certain irregularities. It must be noted that not only were the subjects few (88 cases are here reported) and the investigation not very extensive, but also that deafness is not a simple condition.

The word "deafness" or "deaf-mutism" is used to cover various types of deviation from normal condition. An indication of some of the problems that arise when the causation of deafness is considered, is given by the following quotation from the (British) *Encyclopædia Medica* (under the heading "Deaf-mutism—Causes").

"When a child becomes deaf from scarlet fever, from measles, or from cerebro-spinal fever, we are left in no doubt as to the cause of the deafness Similarly, when a child has never spoken, when he has never had an illness, and when his father, his aunts, his grandparents, or his brothers are deaf-mutes, we are likewise in no doubt as to the nature of his deafness. It is not only congenital, but it is hereditary But there are many cases in which the cause is not at all clear."

Age-averages of performance, with average deviations, for both boys and girls are here given. It will be agreed that the circumstances of the case do not warrant any closer statistical analysis.

CONCLUSIONS.

As said before, any conclusions arrived at must be very tentative. With this reservation, it appears:—

- (1) That the subjects examined showed a close approximation to normal body height. On the average, the boys were slightly inferior in the years 8 to 11, and slightly superior in the years 12 to 14. The girls were slightly inferior in all ages from 9 to 14, excluding the 12th year. In body weight the boys were slightly inferior from 9 to 13 and slightly superior at 8 and 14. The girls were inferior at 9, 10 and 13, but superior at 11, 12 and 14. Consequently, it cannot be said that these subjects were, on the whole, inferior to normal in physique.
- (2) That in strength of grip, both boys and girls were, on the average, inferior to normal at all ages, by amounts that varied irregularly.
- (3) That in brain content both boys and girls were, on the average, markedly inferior to normal subjects by irregular amounts. Porteus's finding of a retardation of three years in the case of certain deaf and dumb subjects, would seem to be supported.
- (4) That in the Assembling Matches performance the boys were, on the average, inferior to normal, the inferiority decreasing with age, and remarkably so at the 13th and 14th years where performance closely approached normal. The same was true of the girls.
- (5) That the results of the Weight Discrimination test were not more decisive than the history of such experimentation (Whipple, page 190) would lead one to hope; and were, particularly in the absence of adequate norms, not of value. The boys on the whole, would appear superior to normal subjects, the girls inferior.

- (6) That in speed of tapping both boys and girls were inferior to normal, the boys less at the 9th and 11th years than at other years, the girls less at the 10th and 11th.
- (7) The large proportion (32 out of 88) miss-sorting reds and greens in this test would seem to indicate that deaf and dumb subjects are on the whole colour-weak. Of the 32, 11 were selected as fair subjects for the Edridge-Green Colour test (being upward of 11 years of age). Four appeared definitely sub-normal and the rest slightly below normal. The problem of colour vision of deaf and dumb subjects needs further investigation.

As for the other tests, no conclusions can be drawn unless norms become available.

By way of general conclusions it seems that deaf and dumb subjects may, by care and training, be made equal to normal subjects in height and weight. On this point it may be noted that teams from this Institute compare more than favourably with the normal subjects in the State Primary Schools, and frequently win football and cricket competitions. But it seems probable that deaf and dumb subjects suffer on the whole a general sensori-motor inferiority, varying in kind and degree. Nothing arising in the investigation suggests the existence of a "compensation," by nature, through increased sensory or motor capacity, for the great loss suffered by these subjects on account of their condition of deafness.

TEST: BODY HEIGHT (INCHES).

(Norms from Sydney Teachers' College.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	Per- formance.	A.D.	Norm.
8	7	47.9	1.3	48.00	8	—	—	—	—
9	9	49.6	1.8	50.07	9	9	47.7	2.3	49.63
10	4	49.4	1.2	51.81	10	5	48.4	2.0	51.59
11	8	52.8	1.0	53.64	11	6	53.4	2.1	53.64
12	3	56.4	2.3	55.19	12	4	58.2	4.1	55.79
13	9	57.5	2.0	57.19	13	4	55.5	1.9	58.15
14	4	61.1	1.8	59.38	14	5	60.0	2.0	60.05
15	7	60.9	3.0	—	15	4	60.8	2.5	—
16	—	—	—	—	16	3	62.3	1.9	—

TEST: BODY WEIGHT (POUNDS).

(Norms from Sydney Teachers' College.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	Per- formance.	A.D.	Norm.
8	7	52.4	4.2	51.82	8	—	—	—	—
9	10	54.5	5.9	56.98	9	9	50.0	5.3	55.27
10	4	52.0	6.5	61.49	10	5	59.8	6.2	60.73
11	8	66.4	5.1	66.53	11	6	66.5	5.2	66.35
12	3	66.0	5.3	72.22	12	4	95.2	12.6	74.34
13	9	78.0	35.4	78.59	13	4	83.8	11.1	84.59
14	4	92.0	12.0	88.20	14	5	96.2	7.0	94.07
15	8	93.8	14.6	—	15	4	99.5	9.2	—
16	—	—	—	—	16	3	118.2	23.1	—

TEST: STRENGTH OF GRIP (KG.).

(Norms from Sydney Teachers' College.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	Per- formance.	A.D.	Norm.
8	7	12.9	1.3	16.59	8	—	—	—	—
9	9	13.6	2.8	18.54	9	9	11.4	2.3	15.77
10	4	13.0	0.9	20.32	10	5	12.0	1.6	17.32
11	9	18.1	1.7	22.33	11	6	14.6	2.1	19.47
12	3	18.0	2.3	23.70	12	4	20.9	5.1	21.62
13	10	23.2	2.6	26.62	13	4	19.9	4.5	24.77
14	4	27.2	5.3	30.17	14	5	25.7	2.2	27.31
15	8	30.2	5.6	—	15	4	25.6	1.9	—
16	—	—	—	—	16	3	25.2	2.1	—

TEST: BRAIN CONTENT (CUBIC MM.).

(Norms from Porteus's "Study in Mental Deviations," p. 31.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	Per- formance.	A.D.	Norm.
8	—	—	—	1296	8	4	1148	—	1209
9	6	1217	52	1296	9	—	—	—	1220
10	12	1219	62	1302	10	5	1117	71	1241
11	4	1297	15	1315	11	6	1192	50	1255
12	8	1255	67	1326	12	5	1226	71	1263
13	2	1270	—	1350	13	3	1230	91	1282
14	12	1297	76	1358	14	3	1168	64	1301
15	5	1332	113	1377	15	4	1272	74	1316
16	7	1324	52	1401	16	—	—	—	—

NOTE.—The measurements were made some months after the other experimentation; thus the Age Distribution was altered, as new ages had to be calculated. Some of the former subjects were not available; some new ones were included.

TEST: ASSEMBLING MATCHES.

(For Norms see Article, *Aus. Journal of Psych. and Philos.*, June, 1927.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	formance. Per-	A.D.	Norm.
8	7	86.3	10.6	74	8	—	—	—	—
9	10	76.6	14.4	67	9	8	96.0	17.5	70
10	4	82.0	5.0	61	10	5	74.3	4.6	60
11	9	62.4	7.1	58	11	6	77.9	14.1	57
12	3	73.3	5.7	57	12	4	61.7	6.7	53
13	10	53.1	10.0	55	13	4	58.5	7.4	54
14	4	52.8	9.5	53	14	5	53.8	5.4	52
15	8	52.3	9.9	—	15	4	59.1	16.4	—
16	—	—	—	—	16	3	47.7	8.2	—

TEST: WEIGHT DISCRIMINATION.

(See Whipple, "Manual of Mental and Physical Tests, p. 190.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	Per- formance.	A.D.	Norm.
8	6	7.2	1.7	12.2	8	—	—	—	11.1
9	7	7.8	1.5	10.2	9	6	8.6	1.7	10.0
10	4	7.3	1.2	8.6	10	5	10.4	2.9	9.2
11	9	8.4	1.2	10.2	11	4	8.1	2.8	7.6
12	3	7.1	0.4	7.6	12	4	8.0	2.0	7.6
13	10	5.5	1.4	6.0	13	4	6.7	0.7	5.6
14	4	6.9	1.4	5.0	14	4	8.2	2.4	7.2
15	8	6.6	1.3	6.2	15	4	6.2	0.7	7.2
16	—	—	—	—	16	3	10.3	1.6	6.8

TEST: TAPPING.

(Norms from Sydney Teachers' College.)

Boys.					Girls.				
Age.	No. of Cases.	Per- formance.	A.D.	Norm.	Age.	No. of Cases.	Per- formance.	A.D.	Norm.
8	7	124	12	132	8	—	—	—	—
9	10	139	14	144	9	9	131	16	142
10	4	133	7	154	10	5	149	6	151
11	9	167	14	162	11	6	154	5	157
12	3	133	13	172	12	4	148	9	165
13	10	163	12	175	13	4	151	9	169
14	4	167	8	183	14	5	167	2	171
15	8	162	9	—	15	4	168	23	—
16	—	—	—	—	16	3	175	6	—

TEST: ÆSTHESIO-METRIC LIMEN.

(No Norms Available.)

Boys.				Girls.			
Age.	No. of Cases.	Per- formance.	A.D.	Age.	No. of Cases.	Per- formance.	A.D.
8	5	37.5	5.6	8	—	—	—
9	10	39.4	2.9	9	7	37.8	1.5
10	4	41.9	6.2	10	5	37.0	1.6
11	9	40.5	2.8	11	6	37.8	1.8
12	3	39.3	1.1	12	4	40.6	2.7
13	10	39.5	2.9	13	4	40.2	1.5
14	4	43.2	2.0	14	5	42.7	1.4
15	8	39.0	3.1	15	4	41.5	1.9
16	—	—	—	16	3	38.6	2.5

TEST: SPAN OF ATTENTION.

(No Norms Available.)

Boys.				Girls.			
Age.	No. of Cases.	Per- formance.	A.D.	Age.	No. of Cases.	Per- formance.	A.D.
8	6	4.6	1.1	8	—	—	—
9	10	4.9	1.3	9	8	3.6	0.8
10	4	5.5	1.0	10	5	5.0	1.6
11	9	6.2	1.2	11	6	6.5	0.8
12	3	5.3	0.9	12	4	5.5	0.8
13	10	7.0	1.0	13	4	6.7	1.7
14	4	6.0	0.4	14	5	7.2	0.9
15	8	6.0	1.3	15	4	6.0	1.0
16	—	—	—	16	3	5.3	0.9

TEST: AIMING.

(No Norms Available.)

Boys.				Girls.			
Age.	No. of Cases.	Per- formance.	A.D.	Age.	No. of Cases.	Per- formance.	A.D.
8	7	167	31	8	—	—	—
9	10	147	21	9	8	169	16
10	4	157	22	10	5	188	41
11	9	170	21	11	6	184	20
12	3	169	27	12	3	180	7
13	10	194	19	13	3	188	5
14	4	175	18	14	2	194	—
15	8	182	18	15	4	166	16
16	—	—	—	16	2	188	—

TEST: COLOUR CARD SORTING.

(No Norms Available.)

Boys.					Girls.				
Age	X	Average Time.	Y	Average Time.	Age	X	Average Time.	Y	Average Time.
8	4	8' 32"	2	10' 9"	8	—	—	—	—
9	4	9' 39"	5	10' 45"	9	3	7' 33"	6	9' 4"
10	3	8' 14"	1	9' 59"	10	5	6' 24"	—	—
11	6	6' 18"	3	6' 14"	11	4	6' 37"	2	4' 9"
12	3	8' 12"	—	—	12	3	6' 54"	1	8' 30"
13	6	5' 3"	3	6' 53"	13	3	6' 10"	1	7' 30"
14	3	6' 9"	1	3' 55"	14	4	4' 32"	1	4' 5"
15	6	5' 32"	1	5' 5"	15	3	4' 32"	1	5' 35"
16	—	—	—	—	16	2	5' 0"	1	3' 52"

X denotes subjects not making mistake in sorting.

Y denotes subjects making mistake in sorting.

Total of subjects making mistakes in sorting = 32. Out of eleven of these, retested by the Edridge-Green colour test, four appeared to be definitely subnormal, the rest slightly inferior to normal, in colour discrimination.

STUDIES IN CHRISTIAN ORIGINS.

II.—Early Christian Teaching and Greek Thought.

By the REV. V. A. S. LITTLE, M.A., B.Litt.,
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THAT the prevailing culture of the Græco-Roman world into which Christianity was so energetically introduced by the Apostles and other missionary Christians did influence Christian doctrine has been a widespread belief for centuries among thoughtful people. But whereas in the past extravagant assertions have been made implying sometimes that Christian doctrine was hardly more than borrowings from Greek philosophy, modern investigation has shown that, despite admitted resemblances to philosophical conceptions, the vital Christian doctrines are intrinsically Christian. Harnack,¹ among recent writers, in drawing attention to the gradual Hellenizing and secularizing of Christianity by Greek scholastic influence, definitely distinguishes between Greek philosophy as an *influence*, and as a *source of doctrine*, and further expresses the opinion that certain ecclesiastical dogmas undoubtedly exhibit the effects of philosophical influence, indeed, are Christian truth in a philosophical form, but are not philosophy itself.

As a natural consequence of its spread in the pagan society of the period, Christianity early began to respond to its new environment by causing the forms of expression and the terminology used in its preaching to approximate to the Gentile mode of thought. But we now have the question: What precisely would this approximation to Hellenistic thought imply? From early Christian writings it is obvious that Græco-Roman thoughts and words were taken up and incorporated in the missionary propaganda, examples of which make their appearance first in the New Testament itself. But the process was gradual. The old Judaic form gradually gave way to the Hellenistic, and henceforth, all subsequent development in dogma was to be determined by the conditions of the prevailing culture.

The civilized world of early Christian times was characterized by a wide diffusion of knowledge among the population. Referring to the intellectual conditions of Asia Minor, wherein Christianity in the first two centuries was more widely known

¹ Dogma.

than in any other part of the world, a modern historian² states that "education was endowed and organized and literary culture became almost universal. Nowhere did the wandering sophist find more eager audiences, and no part of the Roman world in that age contributed so great number of teachers, physicians and philosophers." For centuries this literary education had been at work, and by the second century "had produced a certain type of mind," writes Dr. E. Hatch,³ "logical, rationalistic, analytical, inquisitive, systematic," and "when Christianity came into contact with the society, it modified, reformed, and elevated the ideas which stimulated its actions, but in its turn, it was profoundly modified by the habit of mind of those who accepted it."

As a caution against the opinion that, because of resemblances, one form of teaching must have been influenced by another, Prof. Max Muller⁴ writes: "If it has taken place, then there is only one way to prove it, *viz.*, by the occurrence of foreign words, or possibly by the translation of foreign terms." Obviously, the principle herein laid down will apply to effects of influence which are not of the nature of borrowings of the substance of doctrine, but which appear in the forms of expression and terminology. In the Apologists, such as Justin, Tatian, Theophilus, and Athenagoras, rather than in the Apostolic Fathers, or in other Apologists, will be found a large number of terms and phrases applied to Christian belief which are commonly met with in the Greek religious philosophical writings of the same age. A selection of the terms indicated include ἀρχή, σοφία, μονογενής, δύναμις, ἰδέα, νοῦς, ἐνεργεία, πρωτότοκος, γέννημα, μετουσία, διαίρεσις, κοινωνία, ψωνή, οὐσία, μόρφη, προπηδάν, λόγος, etc., and certain phrases.

In essence, Christianity was not a philosophy. It was historical and experimental, being profoundly characterized and inspired by the stupendous fact of Jesus Christ, the Son of God Incarnate—a fact which contradicted some of the deepest preconceptions of philosophy, and baffled its reasoning to explain. To the essence of this basic Christological fact, no philosophical thought made any difference. However, it is obvious that a comparison of the teaching upon the Son of God in early Christian preaching with the conceptions of the same in the Apologists, reveals differences, in some cases startling. Moreover, this scholastic statement of the doctrine of the Person of Christ in the Apologists, had become by their time (c. 170 A.D.) the orthodox teaching of the Church. And from the fact that the Apologists claim to be delivering the

² Roman Society from Nero to Marcus Aurelius, by S. Dill.

³ Hibbert Lectures.

⁴ Theosophical and Psychological Religion.

inherited doctrinal treasure, it is evident that Christianity, before their day, had become somewhat accommodated to the Hellenistic intellectual environment. But, undoubtedly, the Apologists' doctrine was at base Apostolic. The difference referred to must therefore be confined to the form of statement,—a difference which may be characterized as a change from the primitive, naive, unreflective, to the systematic, scientific, reflective type of thought, reminiscent of the philosophic schools. Christian thought had evidently travelled far, and in its journey had learned a new mode of speech.

Secondly,—The attitude of certain representative Christians of the Second century will help to explain both the inevitableness and the nature of the influence of philosophy upon Christian doctrine. For example, Justin and Athenagoras, prior to their conversion, had been trained under teachers of current philosophy. But, having become familiar with Christian doctrine, they perceived a continuity, in some respects, between it and philosophy. "Since," as Justin⁵ writes, "philosophy is man's most valuable possession and honourable before God to whom it leads," and since the whole object of Plato's philosophy is to obtain a "vision of God," there would seem to be a natural bond and some resemblance between pagan wisdom and that complete doctrine which the Divine Logos came to earth to reveal. And further, such Christians felt that the noble thought of the past ought not to be rendered sterile, but could be of service to Christianity, which they considered "the only true philosophy."

Philip of Side tells us that "Athenagoras was the first leader of the Academic school in Alexandria," and that "He lectured on Christianity while wearing the philosopher's cloak," and also that as the result of studying the scriptures as an opponent, he became converted. Subsequently, Athenagoras nobly fills the part of a great Christian teacher and defender of the faith.

But while the Apologists make free use of philosophy in setting forth their doctrines, it is never for them a substitute for faith, but, as for Clement of Alexandria, only "the shield of faith." Philosophy never determines their doctrines, but rather doctrine determines the use they make of philosophy as an adjuvant.

Thirdly,—What were the *sources* of philosophic influence upon Doctrine? In general terms, answer may be made that philosophic influence issued from the prevailing culture. Though Christians of the first two or three generations, as a body, seem to have strongly resisted pagan teaching good or bad, the Church must have gradually come under the

⁵ Dialogue with Trypho.

spell, for in the second century writers the effects of philosophic influence are such as to cause one to pause. But can we be more precise, for the culture of the period was decidedly eclectic? Some observers consider that Philo of Alexandria was the chief source of these new features in doctrine. But our examination of the genuine works of the Apologists does not show that they either had direct access to Philo's works, or were acquainted with his system. However, so numerous are the resemblances in both terminology and conception between the Christological teaching of these writers and Philo's theory of the Logos, and so striking are some of them, that manifestly, there can be no doubt of a decided Alexandrian influence, even if arising from indirect sources.

But, Alexandrian influence was neither so strong nor so general as to exclude influence from sources more Hellenic in character. For in the Græco-Roman thought of the time there existed a tendency toward conceptions upon the subject of the relation between God and the world similar to those already formulated in the Alexandrian philosophy, though more Hellenic in form. Illustrations of the latter suggestion may be found in such writers as the author of *de Mundo*, Moderatus of Gaza, Alcinous, Plutarch, Maximus of Tyre, Apuleius of Madaura, Numenius of Apamea, "Hermes Treismegistus" and others. These were well-known writers of the period and must have been familiar to cultured men such as the Apologists.

Fourthly,—Passing notice may be taken of the effects of philosophical influence upon doctrine. In general, the effects are discernible in the systematizing and intellectualizing of doctrine, making it a series of dogmatic statements in philosophical form. The earlier plain, simple doctrinal preaching of the Apostles had been gradually substituted by a more abstract statement of the beliefs, and in a new phraseology. The Greek mind had been at work with its passion for analysis and system, and had intellectualized doctrine. Retaining the Hellenic notion of salvation by knowledge, these philosophical Christians present a creed, simple in its elements, but scholastic in form, of the One God and His Son, the Logos, who reveals all the Truth necessary for salvation. They request that faith be placed in a series of abstract propositions, which bear a high resemblance in form to the metaphysical statements upon the nature of the Deity common in the schools. Thenceforth, Christian doctrine was to be stated according to philosophical terminology and conceptions, and so interpreted that simple faith in the Son of God was to be substituted by subscription to a system of abstract proposi-

tions, which, however, in their essence, are not contrary to the teaching given by the Apostles of a previous generation.

But, in conclusion, we ask, *fifthly*,—Was this change in the manner of statement an *advantage* or a *disadvantage*? Christianity is peculiarly the religion for all mankind. Its prevailing form of dogmatic statement was produced by European civilization. In most lands during the centuries, that type of civilization with its categories of thought has been partially, sometimes largely, if not entirely, adopted. It must then have been a great advantage that Christian dogma could be authoritatively stated in terms of that system of thought so intimately associated with the social order amid which Christianity was to propagate itself. Obviously, then, the early Christian thinkers rendered most valuable service to later generations of Christians in responding to their own intuitive impulse to preach to the pagan world in forms of thought intelligible to them. And further, in adopting this mode of dogmatic statement, the Church acquired and adapted to her own use those controversial weapons so effective in her effort to conquer the contemporary culture.

Some writers deplore the intellectualizing of religion in early times, believing that thereby the devotional elements were subverted or degraded. But the Apologists, amongst others, assuredly possessed devotional religion in high degree. They were men of deep spiritual life, and their Christian scholasticism quivers with their divine life of which they made it the vehicle of expression. None of the Apologists regarded reflective thought in itself as a menace to faith. Christianity, being to them "the only true philosophy," was opposed not to logic but only to error. Christian philosophy did not contradict or substitute faith, but only interpreted it. But, that such thinking can be carried too far is shown by the rise of the ethical and inspirational movement led by Montanus, in which the simpler, unreflective type of mind indicated its objection to the more rationalistic type of Christians. Discrepancy between faith and theology is inevitable. For the more the elements of faith are reflected upon, the more will the metaphysical results of criticism tend to penetrate the substance of faith.

However, this philosophical statement of doctrine enabled Christians to exhibit ecclesiastical teaching as a rational system, more developed, wider in range and contact with life, yet no less pure, though more abstract; to relate revelational Truth to universal truth; to place the Person of Christ upon a cosmical basis; and inferentially to constitute the Advent of the Messiah an event in world history. Whatever be the disadvantages, they are amply compensated by the gains.

REVIEWS.

THE ABILITIES OF MAN. By C. Spearman. 1927. London: Macmillan and Co. Price: 16s. net.

This volume, which is the second of three promised by Spearman some three years ago, is the outcome of about twenty years of experimental work carried out at his laboratory at University College, London. The first volume of the series, "The Nature of Intelligence and the Principles of Cognition," was frankly a surprise to most psychologists, who expected, from the nature of Spearman's previous publications, something entirely different. This work gave a treatment of cognition so different from the current and traditional descriptive psychology that its very novelty obscured in many minds the fundamental nature of its contents. It boldly threw overboard the usual text-book classifications of forms, and, starting from first principles, analysed the process. This naturally necessitated the use of a new terminology, which contributed its quota to the apparent lack of appreciation, at any rate, here in Australia. So far, although it has been described by Professor Nunn as "very remarkable and perhaps epoch-making," it has had little effect on the teaching of psychology in our colleges and universities. A masterly piece of analysis, was the general verdict, but to what purpose? What application can be made of the doctrine of "Noegenesis?" If the first volume supplies the "what," this second one provides the "wherefore," and it seems safe to predict that the former will be taken up and re-read with more insight and appreciation, when the latter work has been assimilated.

To no group of readers will the volume be so much conducive to peace of mind as to those specially interested in mental testing, particularly to those working with tests of "intelligence." There is at the present time a world-wide feeling of disquietude, rapidly hardening into active distrust, in some quarters, concerning the results, and, especially the suggested applications of the wholesale mental testing now in vogue. Practice has outstripped theory to such an extent that the latter is now out of sight. Of the reliability of the tests used there has been some attempt at evaluation, but of their validity there has been practically none, unless the *ipse dixit* of the experimenter be taken as a proof of validity. To the continuance of this state of affairs, the publication of this work must act as a deterrent.

The first part of the volume concerns itself with a critical exposition of the various theories held of mental ability, and gives in an expanded and more complete form, the arguments contained in Spearman's article in the British Journal of Psychology of 1912. In particular his own Two Factor Theory is treated more fully and the concept of a general fund of mental energy examined in greater detail.

The second part gives an account of the experimental work carried out in Spearman's own laboratory and the results of other investigations which have a bearing on the problem at issue, and is an answer, and, it would seem, a complete answer to the various criticisms of his theory, and particularly of his proof of the validity of his theory. For since 1912, although American criticism has been largely directed against the theory itself, European criticism has been specifically directed against Spearman's proof of the validity of his theory, and this latter criticism has been necessarily largely of a mathematical nature. For the proof of the existence of his general factor "g" and his specific factor "s," Spearman gives us the tetrad-difference criterion, which he has substituted for his former criterion

of intercolumnar correlation. This tetrad-difference criterion was formulated by him many years ago, but its application was hindered by the absence of a "Probable Error." This, however, was made available by Holzinger and Spearman in 1924, and established the tetrad-difference as a practical criterion.

It is interesting that the writer makes no attempt to define "g" except to suggest that it may be the general fund of mental energy. On page 75 he says: "Notice must be taken that the general factor 'g,' like all measurements anywhere, is primarily not any concrete thing, but only a value or magnitude. Further, that which this magnitude measures has not been defined by declaring what it is like, but only by pointing out where it may be found." The discussion of common specific factors, or group factors, given in Chapter xiii presents conclusions which are of paramount importance for industrial psychology, particularly for the problem of vocational selection. So far, in this domain, the results of considerable efforts in research have been very meagre, largely owing to the fact that there is no well-established theory on which practice may be built. Correlations so far obtained between mental tests and skill in industrial operations must in almost every case be due to the fact that both test and operation involve "g," the specific skill necessary hardly entering as a factor at all. In order that specific factors may become influential, Spearman finds that tests must be made very alike indeed. The inference for industrial psychology is that the selective test should be a replica in miniature of the actual industrial operation. On the whole, investigation shows that specific factors are very rare and extremely elusive. Much further research is necessary in this direction.

From Chapter xiv onwards, Spearman discusses the implications of his theory for all forms of the cognitive process by the analysis of experimental results. He shows that "g," the general factor in human ability, is implied in all forms of cognition, except pure Retentivity, which seems to be independent of "g." But "g" is not the only factor which is functionally general; Preservation, freedom from which Spearman identifies with Garnett's general factor C (Cleverness), oscillation of mental efficiency (fatigue), and a conative factor, W, whose discovery is due to Webb, also show themselves to have a general influence.

The purely mathematical arguments are relegated to the appendix, which probably enhances the value of the work to the general reader, and provides those interested in this side with a summary of the formulæ used with their proofs. The usefulness of this section is increased by the provision of examples illustrating the application of the formulæ to actual data.

It would be quite superfluous to suggest that this book should be read. It must be read, as the first serious attempt to give a scientific basis for the vast edifice of mental testing, much of which must, in the light of its conclusions, be rebuilt on a better foundation, particularly those sections dealing with the measurement of "Intelligence" and Vocational Selection.

G.E.P.

SOCIAL AND POLITICAL IDEAS OF SOME GREAT THINKERS OF THE XVI AND XVII CENTURIES. Edited by F. J. C. Hearnshaw. 1926. London. Harrap. Price: 7s. 6d. net.

The period with which this book deals is known to orthodox and traditional history as that of the great religious wars. Its main interest is supposed to lie in the spectacle of Christian murdering Christian in the name of religion in France, the Netherlands, and Germany.

For those to whom the contemplation of man in his efforts to support the almost intolerable burden of sustained thinking is ultimately more fruitful and immediately less depressing than his pain and degradation the main interest of this age lies elsewhere. "The religious revolution of the XVI century shattered the old ecclesiastical system of Europe and destroyed the international power of the Papacy. Thus it removed the last effective check upon the authority of the new national monarchs." But almost immediately ecclesiastical pretensions took new forms, and Lutheranism, Calvinism, and Anglicanism meant not only a religious creed but something approaching a political platform. There was a great outburst of political speculation, and men had to determine for themselves and so far as they could for the future, what exactly is the nature of the State, what the limits of its power, what the nature of law, within what limits the State may rightly claim dominion. Since, too, the unity of Christendom was no longer even the pretence that it had long been, there arose the question of the relations which do or should exist between States.

The plan adopted in this book is to outline in an introductory chapter the historical background and then to show how the minds of eight representative men reacted to the problems of the time. Each essay has much to commend it. Throughout attention is concentrated on these leading problems and on the solutions offered by the thinker chosen as the subject of the essay. For example, the student of Law who turns to the essay on Grotius in the hope of finding a brief and useful summary of the *De Jure Pacis et Belli* will be disappointed. Much of that great work is a systematized exposition of what was currently taught. What Grotius thought of the State and of Law he will find.

It is the onerous task of Professor Allen to wrestle with the thought of the able but discursive Bodin. He is to be congratulated that out of such turgid, diffuse and obscure material he has been able to construct an intelligible doctrine upon the nature of sovereignty. It is to be regretted that Bodin's teaching upon the subject of religious toleration has not received more of the writer's attention.

Hooker's defence of the doctrine and discipline of the Church of England is now of less importance to political theory than his treatment of the social contract. Nevertheless, having in mind the purpose of this book, the essayist is right in giving his space to that aspect of Hooker's work which was of more importance in his day.

The Ven. Archdeacon Lilley asks in his essay on Suarez whether the middle age was middle aged. How could it have been when the *Renaissance* was obviously the adolescence of western civilization? This essay is, nevertheless, both thorough and brilliant. The essential parts of Suarez's doctrine, that there are certain general principles of right inherent in human reason, and that these principles have the true character of law, are plainly expounded.

The essays on Hobbes, Harrington, and Spinoza are rightly grouped together. Hobbes impressed and directly influenced Harrington. He reacted upon the mind of Spinoza by way of repulsion. The misjudged monarch, James I, the "British Solomon," has justice done him, both for his aims, which were high, and for his ability, which was not so high. If one be born a king shall he not be placed among the great, even though he was not profound or original, and though his mind was cast in an essentially narrow mould?

Was the editor right in displacing for this "wisest fool" "Holman, Duplesses-Mornay, Barclay, Bellarmine, Mariana, Buchanan, Poynt, Althusius, Selden, Milton, Pufendorf, and Filmer?"

ENVIRONMENT AND RACE: A STUDY OF THE EVOLUTION, MIGRATION, SETTLEMENT AND STATUS OF THE RACES OF MAN. By Griffith Taylor. Oxford University Press. 1927. Pp. xvi + 354.

This work is divided into four parts, the second and third of which will be familiar to those who have followed Professor Taylor's work, since the former is based upon his well-known papers in the *American Geographical Review* for 1919 and 1921, while the latter is an amplification of his presidential address to the Geography Section of the Australasian Association for the Advancement of Science in 1923. Part I is a renewed study of changing climates along familiar lines, while Part IV is devoted to extremely interesting and apparently well-founded speculations as to future white settlement.

Part I may be said to comprise an extension into ethnology of the principles laid down for zoology generally by the distinguished American palæontologist, W. D. Matthew, in 1915. Secular changes of climate have produced corresponding migrations of animals, including man. The zoning of climates demands a corresponding zoning of animal life, the later evolved types pressing those more primitive towards the ends of the world as three peninsulas. Matthew has tried to push his thesis too far back in time, but it holds, with a few exceptions, for the Tertiary and after, and is therefore applicable to man.

Part II, which comprises half the book, provides a detailed study of the changes of climate in the three peninsulas, with the corresponding changes of environment, and their effect upon the races of man inhabiting them. It concludes with a restatement of Professor Taylor's migration-zone theory, his most brilliant original contribution to ethnic geography. Stress is laid upon the paramount effect of environment, which is in the best Lamarckian tradition, but a crime against current orthodoxy. Since, however, Heslop Harrison has recently proved beyond all cavil that a new environmental factor can impress a heritable modification upon a race of animals, Lamarckism is looking up.

Part III is a restatement of Professor Taylor's unpopular views upon the vast untouched resources and empty spaces of Australia, together with a study of a white race in an arid environment. This part has a very definite interest for students in most branches in Australia. Most of us are cheery optimists, living in a secure present, and serenely confident that nothing can upset our present civilization.

History tells us, but fails to teach us, that civilizations have come and gone, and will, presumably, continue to come and go, unless and until a proper scientific attention is given to the causes which build them up and break them down. Hence a long view, always provided its scientific premises be sound, may save us from the breakdown of our present civilization. But the man in the street, and his mouth-piece, the politician, care little about long views, and the prophet who points a finger to the rocks ahead is denounced as a Jeremiah and a traitor to his country. A Sydney newspaper has actually suggested that Professor Taylor should be dismissed from his University for traducing Australia! Fortunately, his honesty and courage combined with a faith, which is free from fanaticism, in the value of his methods, will insure the continued repetition of his utterances. The future of Australia will be controlled by facts, and not by political pipe-dreams, and the possibilities are sketched in with a sure hand in this part.

Part IV will have a deep interest for those concerned with the question of population in the future. Population is a function of agriculture and industry. Agriculture is governed by climate, industry by coal. On the basis of these essential factors, the saturation of

population for various parts of the world is worked out and expressed graphically by an ingenious system of "econographs." Justice cannot be done to this part in a few lines.

The book is well made and printed, and has a good index. Since there is no general bibliography, some of the references to literature in the foot-notes might have been given more precisely. The illustrations are numerous and adequate—in some places so numerous that there has been difficulty in arranging them correlatively to the appropriate text. They include a wealth of Professor Taylor's ingenious diagrams. That triumph of the reviewer, the misprint, is present, but it is left to careful readers to find it for themselves. Since there is more than one acknowledged code for the transliteration of Greek into English, it seems unnecessary to use the clumsy "isoikete" (p. 303). "Brakeph" and "dokeph" (p. 40, note) may have their uses as shorthand, but would not "short-head" and "long-head" do as well? The latter is not included in the index—perhaps deservedly. These grumbles apart, author and publisher are to be congratulated upon the production of a fascinating and suggestive work.

L.H.

OCCULTISM, CHRISTIAN SCIENCE AND HEALING. By Arthur W. OSBORN, M.C. 1926. Melbourne. Solar Publications, Ruskin Press, Russell Street.

The doctrine that evil is non-existent is as old as Dionysius the Areopagite, and no doubt many centuries older. That matter is an illusion is the Indian doctrine of Maya. A combination of these two ideas is the essence of Christian Science; but the crudeness of Mrs. Eddy shows sadly against the subtlety of Dionysius and the stateliness of Oriental philosophy. Mr. Osborn, in an elementary but lucid and well-thought treatise, exposes the fallacy of Christian Science, and advocates that view of man, and in particular the disease of man, expounded by modern Theosophy. The contention that man has other vehicles of consciousness than the physical, and that disease is due, in a good measure at least, to disharmony of vibration between these vehicles, is now fairly familiar. What of truth lies in it time and investigation will show.

L.H.A.

DIRECTING MENTAL ENERGY. By Francis Aveling. University of London Press. 1927. Pp. 276, with diagrams and one plate.

Usually teachers and writers of texts of general psychology are content to present the facts of the science and to leave useful applications to studies in applied and industrial psychology. Dr. Aveling has in this book set out to emphasize the applications of general psychological principles to problems of life, and more particularly to the elimination of waste in directing human energy. The opening chapters deal with the problem of waste generally; he passes thence to discuss its mental aspects and the possibility of economizing along these lines. "Fatigue" is the first factor dealt with and next "memory." Two excellent chapters on mental tests and their application to vocational channels then follow.

Up to this stage the treatment of the subject is on fairly conventional lines, but in the next section new fields are opened up. Waste of emotional and will energy are treated briefly but clearly and well illustrated by descriptive discussion of the psycho-galvanic reflex. Aveling here maintains, as he elsewhere argued in recent numbers of the *British Journal of Psychology*, that "the decrease in skin resistance registered by the galvanometer is to be considered as

due to the conative rather than the emotional state of the mind, and meaning, at least to some extent, the amount of conation" (p. 197). Follow chapters on "Ideals and Character" and "Disturbance and Sublimation." The final chapter on "Play" emphasizes its re-restive value and deals with the various theories which attempt to explain its origin.

The text is so clearly written and the explanations so simply made that the work cannot fail to attract and to hold the interest of students commencing their psychological studies. On the other hand, the advanced student and teacher may also read Aveling's treatment of the subject with profit, in that it will suggest fresh aspects for applications of psychological studies that ordinary texts omit.

A. H. MARTIN.

CHANGING BACKGROUNDS IN RELIGION AND ETHICS. By H. Wildon Carr. 1927. London: MacMillan & Co. Ltd. Pp. 224. Price: 7s. 6d. net.

Professor Wildon Carr has attempted in this "Metaphysical Meditation" to "express definitely the consequences in ethics and religion of accepting the principle of evolution in philosophy." I gather from the content of the volume that accepting the principle of evolution in philosophy means the recognition of evolution as a metaphysical principle. The immediate purpose is, therefore, that of making clear, in the light of this principle, the conditions of the moral and religious life. It is the philosophical "background" that is in question.

In the earlier chapters Professor Wildon Carr elaborates Bergson's view of the nature of Matter and Life, a view which he himself accepts. Matter and Life present themselves as two opposing tendencies, the one of "ascent," the other of "descent," and the "task of metaphysics is to devise a rational scheme by which these two opposite principles, matter and life, shall be brought into unity in one concept." In Chapter IV, entitled "Individuality and Continuity," this unification is attempted, and the inclusive concept is affirmed to be that of "life," when life is taken as a cosmic principle. Life, in its cosmic significance "manifests itself in material organisation and purposive activity; matter and mind, therefore, enter into the concept of life as necessary factors, not as independent constituents." Creative evolution is thus the fundamental metaphysical characterization of the universe. The theory is "that all actually existing living forms of activity are the present realization of a universal dynamic activity, manifesting itself as an urge or impulse or striving." In relation to this dynamic activity, individuality is held to be instrumental. "The most insistent feature of the life activity which we conceive as the ground of evolution is the instrumentality of individuality."

In the succeeding chapters, the metaphysical principles indicated above are applied to such problems as the Moral Law, Human Freedom, God, Personality, Human Survival. The space at my disposal does not allow me to indicate, even in outline, the treatment of any one of these problems. But the reader will find Professor Wildon Carr's views challenging at many points. In regard to the work as a whole, it seems to me that a more critical analysis than that furnished by the author is required of the two ideas round which the work turns—the idea of life and that of individuality. In his treatment of individuality Professor Wildon Carr fails almost entirely to view the individual from within; the inner side of individual conduct is almost completely neglected. This comes out strikingly in his treatment of the problem

of Freedom. A deeper analysis of the nature of the individual—in particular the personal individual—would have led to a radical change in the idea of the life which is designated cosmic.

J. MCKELLAR STEWART.

BENEDETTO CROCE: AN AUTOBIOGRAPHY. (Translation from the Italian by R. G. Collingwood, with a Preface by J. A. Smith.) Oxford. Clarendon Press. 1927. Price: 5s. net.

It was Descartes' view that once at least in a lifetime one should stop to take stock of the treasures of one's mind, recall the past and adjust oneself to the future. Benedetto Croce has followed this advice. He wrote during the war (1915) an autobiography which in 1923 appeared in a German translation.¹ The same, with the omission of a concluding paragraph or two now appears in an English version. In this "short but pregnant work" (Professor Smith), the author confides to his readers a story of the heart that must facilitate and illumine in advance all their future reading of his books. Those who now take up his "Philosophy of Practice" will know that in the eyes of its author it is almost an autobiography in which the thoughts and the memories of his early life at the university appear in a clarified, systematized form. We learn, too, that critical studies in literature and antiquarian studies in history took precedence of his interest in philosophy, though even at an early stage the sharp distinction between chronicle and "moral history" had already shaped itself in his mind (p. 51); and that despite a brief period in which "with inexpressible fervour" he threw himself into the study of economics, and in spite of occasional outbreaks of political passion and municipal conscientiousness, his nature from start to finish was that "of a student and thinker" (p. 60). Croce's philosophy emerged only gradually in an effort after personal liberation, and it should sober such as contemplate setting on paper their views on æsthetic theory to follow the throes of those five months of incessant and tormenting labour out of which the "æsthetic" first came to light as a triumph of logical persistency, leaving the creator's mind at last "made up on the problems of the spirit" (p. 64). But it was only when in 1902, and in conjunction with Gentile, "*La Critica*" was planned, a cultural review at once historical, literary and philosophical, that Croce found a medium for self-expression in which all his powers were utilized to the full, so that he soon became the master and spiritual guide of the younger generation (p. 71). Through this prodigious toil Croce eventually achieved peace, which he significantly defines as "harmonious, coherent, self-confident labour and exertion" (p. 76).

Few readers of the Autobiography—and it concerns all to whom philosophy means anything at all—will fail to read it a second time to enjoy at greater leisure the many passages in which Croce has packed in concentrated form his most vital convictions and his most matured insights. How suggestive the conclusion that "true thought is simply thought, beautiful expression simply expression, and so forth, and that false thought and ugly expression are non-thought and non-expression—the not-being which has no reality apart from the dialectical moment which posits and dissolves it."

W.R.B.G.

AN AUSTRALIAN LOOKS AT AMERICA. By H. G. ADAM. (Cornstalk Publishing Company, Sydney, pp. 118).

Mr. H. G. Adam, as the representative of a group of Australian newspapers, accompanied the recent Australian delegation which visited the United States of America to study industrial conditions

¹ *Philosophie der Gegenwart in Selbstdarstellungen* (W. Schmidt).

there. In his book he explains how, in his search for the secret of high wages, he discovered that there was none to find, for, judged by Australian standards, wages in the U.S.A. are not high. His conclusion is that "in the combination of the money he gets and what he can buy with it, the average Australian worker is better off than the average American worker." He estimates the average earnings of the unskilled man in the U.S.A. at £6 a week of 50 hours, provided he is continuously employed, and this is the wage for 90% of the workers in manufacturing industries. The author unhesitatingly concludes that it is not possible to maintain in U.S.A. on that amount the average standard of comfort of an Australian worker on £4 a week.

This conclusion is supported by some not very convincing evidence. Too much reliance is placed upon single instances which he appears to prefer to general statistical evidence which points in the other direction. It is true that statistics of relative wages and standards of living in U.S.A. and in Australia are difficult to get and easy to misinterpret, but this does not justify the author, whilst accepting Australian public statistics, in saying that he "would not give a snap of the fingers for so-called official statistics relating to conditions of industry" in the U.S.A.

From his experience in America Mr. Adam draws lessons for the Australian worker and for the Australian employer. To the former he recommends piece-work, properly safeguarded by mutual agreement against the usual abuses of rate-cutting and the like. He would wish to see Australian unionism adopt the attitude of the American union leaders who said: "We believe that under certain conditions piece-work is the fairest and most reasonable means of providing the worker with an incentive." To the employer he recommends a study of the principles of business management and a realization of the responsibility of management for the efficiency of industry. "The American worker," he writes, "beats the Australian in output per head simply because the former has his work far better organized."

R. C. MILLS.

REALITY. By B. H. Streeter. Pp. xiii, 344. MacMillan & Co. London. 1926. Price: 8s. 6d. net.

This book is intended to provide an answer, or at least the materials for an answer, to the most important questions we can ask about the universe. It is the universe itself that compels us to ask these questions, but the answers can never be adequate; they can only provide us with "representations" of reality. "Reality as a whole is not only too large, but also too rich, a thing for our finite minds to apprehend in its completeness" (p. 44). How, it may be asked in passing, do our finite minds manage to find this out? Two main types of representation are to be distinguished: that given by Science and that given by Religion. But, though distinct, they are not opposed; they have only been considered to be so because scientists took artificial concepts like "mechanism" to be actually descriptive of the subject-matter they were applied to. Recently, however, scientists have come to see that they are dealing with reality only in its quantitative aspect. "But if quality as well as quantity is an ultimate constituent of reality, then reality in its qualitative aspect can only be known if this can be expressed in some adequate representation" (p. 39). The contrast is similar to that between diagrammatic and pictorial representation, each of which has value for certain purposes, and which may be used to supplement one another. But in order clearly to see that "the metrical and non-metrical aspects of the

world" cannot be known in the same way, we require to have the difference between the "Two Ways of Knowledge" explained in detail.

Chapter IV, in which this subject is discussed, is accordingly the most important part of the book; and the weakness of its argument accounts for the general weakness of Canon Streeter's case. Anyone who claims to have found no intellectual satisfaction in any system of philosophy he has come across, might be expected to show some knowledge of the history of philosophy and of the arguments that have been brought against the position he takes up. Yet Canon Streeter makes a distinction between "the method of Science—classification, analysis, and reduction to law" and "the method of direct intuitive knowledge," and supports it by saying that we are more certain of our own "life" than we are of anything else ("if I did not already think or feel, I could have neither commonsense knowledge of everyday things nor the organized form of that knowledge which we call Science," p. 90), as if philosophy had ended with Descartes. It is, he goes on, because of this direct experience within ourselves of something which we feel rather than know, that we are able to interpret any behaviour as that of living things. "Human intercourse depends entirely on the supposition that I can approximately interpret the words, looks, actions of other men as being the expressions of feelings and intentions more or less similar to those which I should myself express by similar words, looks or actions" (p. 100). It is such expressions or objectifications of the spirit of man, which are primarily characteristic of Art, that serve the religious consciousness as symbolic representations of the "quality" of the universe.

Detailed criticism regarding the possibility of expressing "direct intuitive knowledge" in this way, or of its being used to check or supplement the results of science, when the one works by ignoring individuality and the other by asserting, or rather by being it, is obviously not called for. The main objections are (i) that neither "intuition" nor observation can tell us that they supplement one another, (ii) that, as the example given shows, it is only by reference to specific similarities, and not to "individuality," that we can, if we do, interpret behaviour on the analogy of our experience of ourselves, (iii) that, as has often been pointed out, the fact that, unless I know, I do not know anything, does not in the least prove that I have any knowledge of my knowing, (iv) that classification can only take place in terms of quality, with which Science was supposed not to deal, and that even so it can only be classification of particular things; that, in fact, to say that the amœba "has individuality" adds nothing to the meaning of the expression "an amœba."

Although certain scientists have said it, it is, none the less, absurd to say that Science does not deal with quality. We can only measure by measuring something, and quality and quantity are never apart, to be artificially brought together. This is implicitly admitted in Streeter's recognition that Science can only be "supplemented" by immediate knowledge of the incommunicable. Naturally a little ingenuity will enable us to take *anything* as representative of this inner identity; we can call it the rational or the immortal or even the crucified. One symbol is as good as another when they cannot be compared with the original. But the way out of these difficulties is to replace illogical science by logical science, and not to add to it an equally illogical symbolism. As science is now developing, however, this can hardly be looked for. We must rather, as this book shows, expect to see Science and Religion shaking hands over the mangled corpse of Philosophy.

JOHN ANDERSON.

THIS AND THAT. By T. Jasper. 1927. Sydney. Pallamana Press. Pp. 85. Price: 2s.

This is a collection of essays which have all previously appeared in Australian publications. Some are reprinted from the *Bulletin*, others from the *Triad*, and one from this journal. The subjects treated are "Novelty and Difficulty," "Feminine Psychology," "Possessions," "The Death of Love," "Relativity," "Idealism," "The Social Reformer and the Critic," "Mind," "Socialism," "Criticism and the Feminine," "Woman and History," "Altruists," "Sincerity," "The Making of Converts," "Gardens," "Love," "Sacrifice."

On this series of essays Mr. Jasper is to be congratulated. They are all interesting. They exhibit penetration and acuteness, common-sense and moderation. They are sound in judgment and critical in conception, yet are admirable in their gentleness of tone. The style is terse and effective, and is relieved by a nice use of epigram and antithesis.

The book is on sale at all booksellers in Sydney.

H.T.L.

JOURNALS RECEIVED.

THE JOURNAL OF PHILOSOPHY. Edited by Professors Woodbridge, Bush and Schneider, Columbia University. Published fortnightly. 4 dollars a year.

Vol XXIV. No. 13. June 23, 1927. Rignano's Hypothesis of a Vital Energy and the Prerequisites of a Sound Theory of Life: F. S. C. Northrop. No. 14. July 7. The Milesian Background of our Scientific Ontology: Harold Chapman Brown. A Phenomenological Interpretation of Physico-Chemical Configurations and Conscious Structures (I): Oliver L. Reiser. No. 16. August 4. The Irrationality of the Irrational: Sidney Hook. William James and the Will to Believe: F. C. S. Schiller. No. 17. August 18. An Empirical Account of Appearance: John Dewey. Moral Freedom: M. R. Gabbert. No. 18. September 1. Relativity and the Lay Mind (I): Benjamin Ives Gilman. The Datum as Essence: George Boas. No. 19. September 15. Relativity and the Lay Mind (I): Benjamin Ives Gilman. If We Have Life, De We Need Philosophy?: Marjorie S. Harris. No. 20. September 29. A principle of Realism: Charles M. Perry. Anthropology and the Rights of Man: Benjamin Ginsburg.

PSYCHE. Edited by C. K. Ogden. Kegan Paul, Trench Trubner and Co., London. Published Quarterly. Price: 5s.

No. 29. July, 1927. Orthology: Editorial. The Nature of the Colour Sensations: Christine Ladd Franklin. Can Insects See Colour? H. Munro Fox. Are We Becoming More Conscious? I. A. Richards. The Origin of Language: Sir Richard Paget. Consciousness Motation and Emotion: William Moulton Marston. The Dogmas of Science: Winthrop Parkhurst. A Critique of Dynamism: Scott Buchanan. Spengler, the Spenglerites and Spenglerism: Mortimer J. Adler. Thus Spake Spengler: Heinrich Klüver.

JOURNAL OF PHILOSOPHICAL STUDIES. Edited by S. E. Hooper. Published Quarterly for the British Inst. of Phil. Studies, by Macmillan and Co., London. Price 3s. 6d.

God and the World: Professor Clement C. J. Webb. The Animate and Mechanical Models of Reality: Joshua C. Gregory, B.Sc. A Functional Theory of Knowledge (I): Professor Hugh A. Reyburn. Mind Considered from the Point of View of Biology: Professor Julian Huxley. A Study of Santayana, with some Remarks on Critical Realism: David MacGhie Cory. The Bearing of Ethics on Psychology: Olaf Stapleton, M.A., Ph.D.

THE INTERNATIONAL JOURNAL OF PSYCHO-ANALYSIS. Official Organ of the International Psycho-Analytical Association. Baillière, Tindall and Cox, London. 30s. per annum.

Vol. VIII. Part 3. July, 1927. Lecture on Technique in Psycho-Analysis: Edward Glover. Symposium on Child Analysis: Melanie Klein, Joan Riviere, M. N. Searl, Ella F. Sharpe, Edward Glover, and Ernest Jones. Concluding Remarks on the Question of Lay Analysis: (I) Sigmund Freud, (II) M. Eitingon. A Dream from an Eleventh Century Japanese Novel: Ruth J. Mack. Scent in a Symptomatic Act: D. Bryan. Slips of the Tongue in Mediæval Literature. George M. Rutter.

ARCHIVIO GENERALE DI NEUROLOGIA, "PSICHIATRIA E PSICOANALISI. Edited by M. Levi-Bianchini. Official Organ of the Italian Psycho-Analytic Society. Annual subscription outside Italy, 6 dollars. Teramo, Italy.

Vol. VIII. No. 2. June, 1927. Association de la Sclerodermie au Syndrome de Basedow: C. J. Parhon and Z. Caraman. Su qualche criterio regolatore di tecnica psichiatrico-ospedaliera: F. Del Greco.

INDUSTRIAL FATIGUE RESEARCH BOARD. Report No. 43. A Study of Telegraphists' Cramp. By May Smith, M.A., Millais Culpin, M.D., F.R.C.S., and Eric Farmer, M.A. London: His Majesty's Stationery Office. 1927. Price 1s. 6d.

PHILOSOPHISCHER WELTANZEIGER. Edited by Paul Feldkeller, Schönwalde (Niederbarnim) bei Berlin. Price 25 Pfg., or yearly (6 numbers) Mk. 1.40.

Vol. 1926/27. No. 1. Der philosophische Ertrag des 8. Internationalen Psychologenkongresses: By P. F. Die Philosophie der Völker im Spiegel ihrer Zeitschriften; Die Niederlande: By P. F. Die Internationale School voor Wijsbegeerte zu Amersfort: By P. F. Die Philosophie der Indianer and Die Philosophie des Bolschewismus: By P. F. No. 2. Philosophie und internationale Beziehungen: Prof. Dr. Erich Becher. Die Philosophen von Harvard: Prof. Dr. K. Vorovka. Albert Schweitzer als internationaler Kulturfactor: Prof. Dr. Oskar Kraus. Der Kongress der Rechtsphilosophen: By P. F. No. 3. Das polynesishe Denken: Dr. Paul Feldkeller. Die Philosophie der Völker im Spiegel ihrer Zeitschriften (continued); Australia, A New Land of Philosophy. (In this article Dr. Feldkeller reviews at length and very sympathetically the early numbers of the Australasian Journal of Psychology and Philosophy, as also the work of the 3rd and 4th Congresses of The Australasian Association of Psychology and Philosophy. The editor of our own journal is

naturally pleased to record this very full reference to our activities in Australia. The reference shows, too, that the Philosophischer Anzeiger is living up to its promise, and is giving attention to philosophical studies in all parts of the world. It probably gives the best orientation of any publication of its kind. It has the further attraction of being appropriately illustrated and is very reasonable in price.) Der philosophische Kongressgedanke: Dr. J. E. Heyde.

No. 4. Die philosophische Landschaft. (I) Ostpreussen: By P. F. Dritter Kongress für Ästhetik und allgemeine Kunstwissenschaft in Halle vom 7-9. Juni: By P. F. Die Generalversammlung der Kantgesellschaft in Halle vom 10-11 Juni: By P. F.

WELFARE WORK. The journal of the Institute of Industrial Welfare Workers. 29, Gordon Square, London, W.C.1. Price 5s. per annum.

THE ADELAIDE UNIVERSITY MAGAZINE.

A REVIEW OF LIFE AND WORK. Published by S. John's College, Morpeth, N.S.W. Edited by E. H. Burgmann, M.A. Price 2s. per copy.

THE MEDICAL JOURNAL OF AUSTRALIA. Sydney. Published weekly. Price 1s.

BOOKS RECEIVED.

CHIVALRY AND SOCIAL LIFE IN THE MIDDLE AGES. By Dorothy Margaret Stuart. 1927. London. George G. Harrap. Price: 1s. 6d. net.

A very engaging little book, simple, clear and well-informed. It is freely and admirably illustrated.

EPISODES FROM THE STORY OF MANKIND. By Hendrik Van Loon. 1927. London. George G. Harrap. Price: 1s. 6d. net.

An abbreviated edition of that fascinating book, "The Story of Mankind." A genuine historical conspectus most interestingly written.

WHIMSICAL STORIES TO TELL. By Helen Williams. 1927. London. George G. Harrap. Price: 3s. 6d. net.

An unusual and very attractive set of stories, healthy in tone without being sentimental or mawkish. There is a frontispiece in colour.

MORE STORIES TO TELL. By Maud Lindsay. 1927. London. George G. Harrap. Price: 3s. 6d.

Another delightful set of stories, with frontispiece in colour.

NOTES AND NEWS.

May we call the attention of our readers to the appeals now being made to their respective publics by the Universities of Sydney and Adelaide? The appeal of the University of Adelaide is for funds to erect a Union and War Memorial; the appeal of the University of Sydney is for funds to carry on its essential services to the community. University interests are inevitably community interests. We have, therefore, no hesitation in strongly commending these two appeals to our readers.

The University of Tasmania recently created a Chair of Psychology and Philosophy, and appointed Professor E. Morris Miller to it. He will continue to act as Director of the State Psychological

Clinic, which is now associated with the Department of Psychology for clinical teaching and demonstrations. Mr. H. T. Parker, M.A., Supervisor of Special Classes, has been appointed to the Clinic as Associate Psychologist. The medical examiners of the Clinic are Drs. W. Inglis Clark, Ethel Hawkins and Blanche Chittick.

An Institute of Industrial Psychology has been formed in Sydney. The name of the Institute is "The Australian Institute of Industrial Psychology," and its office is in Manufacturers' House, 26 O'Connell Street. The President is Mr. H. B. Sevier, Vice-President of the Chamber of Manufactures of N.S.W. The Hon. Director is Dr. A. H. Martin, Lecturer in Psychology at the University of Sydney. The Hon. Secretary is Mr. Frank L. Edwards, President of the Vocational Guidance Association of N.S.W. and Secretary of the Chamber of Manufactures of N.S.W. The University of Sydney is represented on the Council by Professor Lovell. The Institute has been formed along the lines of the National Institute of Industrial Psychology of England, whose Director, Dr. C. S. Myers, has been very sympathetic and helpful to the new Institute in Australia. The Institute is controlled by a strong Council of representative citizens, and much is expected of it. The Institute will undertake various kinds of mental examination, vocational guidance and selection, and private investigations for industrial and commercial firms. The minimum annual subscription (which includes a journal) is one pound.

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At meetings of the Auckland Local Branch of the Association held during 1927, papers on the following subjects were read and discussed:

"Self": Professor W. Anderson.

"Free Will and Determinism": Messrs. S. W. Scott and H. Garner.

"Vitalism": Miss M. W. Crookes, M.A.

"Civilization and the Philosophic Outlook": The Very Rev. H. K. Archdall, M.A.

"The Gestalt Psychology": Mr. H. C. Becroft, M.A.

Two very interesting public lectures were also delivered to large and appreciative audiences, namely:

"Civilization and the Philosophic Outlook": The Very Rev. H. K. Archdall, M.A.

"The Philosophy of Bernard Shaw": Mr. J. W. Shaw, M.A.

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The Sydney Local Branch of the Association has held two further meetings, one on September 15th, when Professor John Anderson read a provocative and interesting, if very unorthodox, paper on the subject of "Determinism and Ethics"; and one on October 27th, when Professor V. A. Bailey, of the Department of Physics gave an informing and interesting address on "Probability." Professor Bailey made a difficult subject easy and entertaining. Professor Anderson's paper met with some adverse criticism at discussion time. Professor Bailey's address was also followed by a discussion.

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Professor Boyce Gibson, of Melbourne, will be on leave next year. With his family he will visit Europe, spending his time in England, France, Germany and Italy. The visit he is sure to pay to Jena will be saddened by the absence of Eucken's familiar figure.

